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William Neergaard.

PROCEEDINGS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION

AT THE

THIRTY-FIRST ANNUAL MEETING,

HELD AT WASHINGTON, D. C., SEPTEMBER, 1883.

ALSO THE

CONSTITUTION, BY-LAWS, AND ROLL OF MEMBERS.

PHILADELPHIA:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1884.

OFFICERS OF THE ASSOCIATION.

1883-84.

PRESIDENT.

WILLIAM S. THOMPSON . . . . Washington, D. C.

FIRST VICE-PRESIDENT.

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THIRD VICE-PRESIDENT.

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LOCAL SECRETARY.

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REPORTER ON PROGRESS OF PHARMACY.

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Mahlon N. Kline	Philadelphia.
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Chas. Becker	Washington, D. C.
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Samuel A. D. Sheppard	Boston, Mass.
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Daniel C. Robbins	New York.
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COUNCIL.

MEMBERS OF THE COUNCIL.

Term expires.		
1884.	The Officers of the Association, *ex officio.*	
"	William J. M. Gordon	Cincinnati, O.
"	John Ingalls	Macon, Ga.
"	Joseph L. Lemberger	Lebanon, Pa.
1885.	Samuel A. D. Sheppard	Boston, Mass.
"	William Saunders	London, Ont.
"	Albert E. Ebert	Chicago, Ill.
1886.	Joseph P. Remington	Philadelphia, Pa.
"	George W. Kennedy	Pottsville, Pa.
"	Henry J. Menninger	Brooklyn, N. Y.

OFFICERS OF THE COUNCIL.

Joseph P. Remington, Chairman. | C. L. Diehl, Vice-Chairman.
George W. Kennedy, Secretary.

COMMITTEES OF THE COUNCIL.

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Henry J. Menninger,
John Ingalls,
Frederick H. Masi,
Edward W. Runyon,
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On Finance: Samuel A. D. Sheppard, Chairman.
Joseph L. Lemberger,
Henry J. Menninger.

On Publication: Joseph P. Remington, Chairman.
C. Lewis Diehl,
William Saunders,
Charles Rice,
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On Centennial Fnud: William S. Thompson, Chairman.
S. A. D. Sheppard,
John M. Maisch.

On Entertainments: Joseph L. Lemberger, Chairman.
Henry J. Menninger,
Henry C. Schranck,

On Railroads: Thomas J. Macmahan, Chairman, New York.
Henry C. Schranck,
John M. Maisch.

LIST OF OFFICERS OF THE ASSOCIATION,

SINCE ITS ORGANIZATION.

(*Deceased in Italics.*)

PRESIDENTS.

Daniel B. Smith	Philadelphia	1852–53
William A. Brewer	Boston	1853–54
William B. Chapman	Cincinnati	1854–55
John Meakim	New York	1855–56
George W. Andrews	Baltimore	1856–57
Charles Ellis	Philadelphia	1857–58
John L. Kidwell	Georgetown, D. C.	1858–59
Samuel M. Colcord	Boston	1859–60
Henry T. Kiersted	New York	1860–62
William Procter, Jr.	Philadelphia	1062–63
J. Faris Moore	Baltimore	1863–64
William J. M. Gordon	Cincinnati	1864–65
Henry W. Lincoln	Boston	1865–66
Frederick Stearns	Detroit, Mich.	1866–67
John Milhau	New York	1867–68
Edward Parrish	Philadelphia	1868–69
Ezekiel H. Sargent	Chicago	1869–70
Richard H. Stabler	Alexandria, Va	1870–71
Enno Sander	St. Louis	1871–72
Albert E. Ebert	Chicago	1872–73
John F. Hancock	Baltimore	1873–74
C. Lewis Diehl	Louisville, Ky	1874–75
George F. H. Markoe	Boston	1875–76
Charles Bullock	Philadelphia	1876–77
William Saunders	London, Ont	1877–78
Gustavus J. Luhn	Charleston, S. C.	1878–79
George W. Sloan	Indianapolis, Ind	1879–80
James T. Shinn	Philadelphia	1880–81
P. Wendover Bedford	New York	1881–82
Charles A. Heinitsh	Lancaster, Pa.	1882–83
William S. Thompson	Washington, D. C.	1883–84

FIRST VICE-PRESIDENTS.

George W. Andrews	Baltimore	1852–53
George D. Coggeshall	New York	1853–54

Henry T. Cummings	Portland, Me.	1854–55
Charles B. Guthrie	Memphis, Tenn.	1855–56
John L. Kidwell	Washington, D. C.	1856–57
James Cooke	Fredericksburg, Va.	1857–58
Edward R. Squibb	Brooklyn, N. Y.	1858–59
William Procter, Jr.	Philadelphia	1859–60
William J. M. Gordon	Cincinnati	1860–62
John Milhau	New York	1862–63
John M. Maisch	Philadelphia	1863–64
Richard H. Stabler	Alexandria, Va.	1864–65
George C. Close	Brooklyn, N. Y.	1865–66
Edward Parrish	Philadelphia	1866–67
Robert J. Brown	Leavenworth, Kan.	1867–68
Ferris Bringhurst	Wilmington, Del.	1868–69
Ferdinand W. Sennewald	St. Louis	1869–70
Fleming G. Grieve	Milledgeville, Ga.	1870–71
C. Lewis Diehl	Louisville, Ky.	1871–72
Samuel S. Garrigues	East Saginaw, Mich.	1872–73
William Saunders	London, Ont.	1873–74
Joseph Roberts	Baltimore	1874–75
Frederick Hoffmann	New York	1875–76
Samuel A. D. Sheppard	Boston	1876–77
Ewen McIntyre	New York	1877–78
Frederick T. Whiting	Great Barrington, Mass.	1878–79
T. Roberts Baker	Richmond, Va.	1879–80
George H. Schafer	Fort Madison, Ia.	1880–81
Emlen Painter	San Francisco	1881–82
John Ingalls	Macon, Ga.	1882–83
Charles Rice	New York	1883–84

SECOND VICE-PRESIDENTS.

Samuel M. Colcord	Boston	1852–53
Alexander Duval	Richmond, Va.	1853–54
John Meakim	New York	1854–55
Charles Ellis	Philadelphia	1855–56
Frederick Stearns	Detroit, Mich.	1856–57
Samuel P. Peck	Bennington, Vt.	1857–58
James O'Gallagher	St. Louis	1858–59
Joseph Roberts	Baltimore	1859–60
William S. Thompson	Baltimore	1860–62
Eugene L. Massot	St. Louis	1862–63
Charles A. Tufts	Dover, N. H.	1863–64
Enno Sander	St. Louis	1864–65
Elijah W. Sackrider	Cleveland, O.	1865–66
Ezekiel H. Sargent	Chicago	1866–67
N. Hynson Jennings	Baltimore	1867–68
Edward S. Wayne	Cincinnati	1868–69
John H. Pope	New Orleans	1869–70
James G. Steele	San Francisco	1870–71
George F. H. Markoe	Boston	1871–72
Edward P. Nichols	Newark, N. J.	1872–73

John T. Buck	Jackson, Miss.	1873–74
William T. Wenzell	San Francisco	1874–75
T. Roberts Baker	Richmond, Va.	1875–76
Gustavus J. Luhn	Charleston, S. C.	1876–77
John Ingalls	Macon, Ga.	1877–78
Henry J. Rose	Toronto, Can.	1878–79
Joseph L. Lemberger	Lebanon, Pa.	1879–80
William S. Thompson	Washington	1880–81
George Leis	Lawrence, Kan.	1881–82
Louis Dohme	Baltimore	1882–83
Frederick H. Masi	Norfolk, Va.	1883–84

THIRD VICE-PRESIDENTS.

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Joseph Laidley	Richmond, Va.	1854–55
Henry F. Fish	Waterbury, Conn.	1855–56
Henry T. Kiersted	New York	1856–57
A. E. Richards	Plaquemine, La.	1857–58
Robert Battey	Rome, Ga.	1858–59
Edwin O. Gale	Chicago	1859–60
Theodore Metcalf	Boston	1860–62
J. Faris Moore	Baltimore	1862–63
George W. Weyman	Pittsburg	1863–64
Thomas Hollis	Boston	1864–65
Charles A. Heinitsh	Lancaster, Pa.	1865–66
John W. Shedden	New York	1866–67
Daniel Henchman	Boston	1867–68
Albert E. Ebert	Chicago	1868–69
Joel S. Orne	Cambridgeport, Mass.	1869–70
Eugene L. Massot	St. Louis	1870–71
Matthew F. Ash	Jackson, Miss.	1871–72
Henry C. Gaylord	Cleveland, O.	1872–73
Paul Balluff	New York	1873–74
Augustus R. Bayley	Cambridgeport, Mass.	1874–75
Christian F. G. Meyer	St. Louis	1875–76
Jacob D. Wells	Cincinnati	1876–77
Emlen Painter	San Francisco	1877–78
William H. Crawford	St. Louis	1878–79
Philip C. Candidus	Mobile, Ala.	1879–80
William Simpson	Raleigh, N. C.	1880–81
John F. Judge	Cincinnati	1881–82
William B. Blanding	Providence, R. I.	1882–83
Edward W. Runyon	San Francisco	1883–84

TREASURER.

Alfred B. Taylor	Philadelphia	1852–54
Samuel M. Colcord	Boston	1854–56
James S. Aspinwall	New York	1856–57
Samuel M. Colcord	Boston	1857–59
Ashel Boyden	Boston	1859–60

Henry Haviland	New York	1860–63
J. Brown Baxley	Baltimore	1863–65
Charles A. Tufts	Dover, N. H.	1865–84

RECORDING SECRETARIES.

George D. Coggeshall	New York	1852–53
Edward Parrish	Philadelphia	1853–54
Edward S. Wayne	Cincinnati	1854–55
William J. M. Gordon	Cincinnati	1855–59
Charles Bullock	Philadelphia	1859–60
James T. Shinn	Philadelphia	1860–62
Peter W. Bedford	New York	1862–63
William Evans, Jr.	Philadelphia	1863–64
Henry N. Rittenhouse	Philadelphia	1864–65
John M. Maisch	Philadelphia	1865–84

CORRESPONDING SECRETARIES.

William Procter, Jr.	Philadelphia	1852–53
William B. Chapman	Cincinnati	1853–54
William Procter, Jr.	Philadelphia	1854–57
Edward Parrish	Philadelphia	1857–58
Ambrose Smith	Philadelphia	1858–59
William Hegeman	New York	1859–60
Peter W. Bedford	New York	1860–62
John M. Maisch	Philadelphia	1862–63
Peter W. Bedford	New York	1863–66

LOCAL SECRETARIES.

Peter Wendover Bedford	New York	1866–67
Alfred B. Taylor	Philadelphia	1867–68
Henry W. Fuller	Chicago	1868–69
J. Faris Moore	Baltimore	1869–70
William H. Crawford	St. Louis.	1870–71
Henry C. Gaylord.	Cleveland, O.	1871–72
Thomas H. Hazard	Richmond. Va.	1872–73
Emil Scheffer.	Louisville, Ky.	1873–74
Samuel A. D. Sheppard	Boston.	1874–75
Adolphus W. Miller	Philadelphia	1875–76
Henry J. Rose	Toronto, Can.	1876–77
Jesse W. Rankin	Atlanta, Ga.	1877–78
Eli Lilly	Indianapolis, Ind.	1878–79
Charles F. Fish	Saratoga Springs, N. Y.	1879–80
William T. Ford	Kansas City, Mo.	1880–81
Hiram E. Griffith	Niagara Falls, N. Y.	1881–82
Charles Becker	Washington.	1882–83
Henry C. Schranck	Milwaukee	1883–84

REPORTER ON PROGRESS OF PHARMACY.

C. L. Diehl,	Louisville, Ky.	1873–84

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President, in compliance with the following resolutions:

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That while it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer, of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

Alabama,	P. C. Candidus, cor. Dauphin and Cedar streets,	Mobile.
Arkansas,	Geo. W. Cabell, Congress and Bull streets,	Hot Springs.
California,	James G. Steele, 521 Montgomery street,	San Francisco.
Colorado,	Hugo R. Hartung, 230 Fifteenth street,	Denver.
Dist. of Columbia,	John A. Milburn, 1101 F street, N. W.,	Washington.
Connecticut,	Charles A. Rapelye, 605 Main Street,	Hartford.
	Alonzo F. Wood, 2 Church street,	New Haven.
	Luzerne I. Munson, Apothecaries' Hall,	Waterbury.
Delaware,	Linton Smith, cor. Seventh and Market streets,	Wilmington.
Georgia,	Theo. Schumann, Whitehall and Hunter streets,	Atlanta.
	Robert H. Land, 270 Broad street,	Augusta.
	John Ingalls, cor. Fourth and Poplar streets,	Macon.
Illinois,	Henry W. Fuller, 220 Randolph street,	Chicago.
	David G. Plummer, 6 Main street,	Bradford.
	Charles B. Allaire, 108 Main street,	Peoria.
Indiana,	Joseph F. Brandon, 18 East Anderson street,	Anderson.
	Henry J. Schlæpfer, Second and Main streets,	Evansville.
	George W. Sloan, 7 East Washington street,	Indianapolis.
	David Hilt, 84 Main street,	Lafayette.
Iowa,	Theodore W. Ruete, 379 Main street,	Dubuque.
	Olaf M. Oleson, Market street,	Fort Dodge.
	George H. Schafer, 129 Front street,	Fort Madison.

Kansas,	George Leis, 90 Massachusetts street,	Lawrence.
	Robert J. Brown,	Leavenworth.
Kentucky,	C. Lewis Diehl, cor. Third and Broadway,	Louisville.
	William H. Averill, 435 Main street,	Frankfort.
Louisiana,	Isaac L. Lyons, 42 Camp street,	New Orleans.
	Joseph G. Thibodeaux, Main street,	Thibodeaux.
Maine,	Noah S. Harlow, 4 Smith's Block,	Bangor.
	Edmund Dana, Jr., 373 Congress street,	Portland.
Maryland,	Robert Lautenbach, Eutaw and Saratoga streets,	Baltimore.
	Thomas W. Shryer, 103 Baltimore street,	Cumberland.
Massachusetts,	S. A. D. Sheppard, 1129 Washington street,	Boston.
	Joel S. Orne, 493 Main street,	Cambridgeport.
	B. Frank Stacey, 51 Vine street,	Charlestown.
	Frederick T. Whiting, Main street,	Great Barrington.
	Freeman H. Butler, 141 Central street,	Lowell.
	Benjamin Proctor, 6 Healey's Arcade,	Lynn.
	Samuel O. Daniels, Main and Summer streets,	Natick.
	James E. Blake, 64 North Second street,	New Bedford.
	Joseph J. Estes, cor. Union and Church streets,	Rockland.
	Thomas B. Nichols, 159 Essex street,	Salem.
	Charles P. Alden, 270 Main street,	Springfield.
	William Bush, 56 Front street,	Worcester.
Michigan.	Ottmar, Eberbach, 12 South Main street,	Ann Arbor.
	Theodore Ronnefeld, 195 Gratiot avenue,	Detroit.
Minnesota,	Karl Simmon,	St. Paul.
Missouri,	James F. Hurt, Broadway,	Columbia.
	William T. Ford, 1305 Cherry street,	Kansas City.
	William H. Crawford, 800 Washington avenue,	St. Louis.
Nebraska,	Charles F. Goodman, 180 Farnham street,	Omaha.
New Hampshire,	Bayard T. Perry, 1088 Elm street,	Manchester.
	E. S. Russell, 69 Main street,	Nashua.
	Joseph H. Thacher, 12 Market street,	Portsmouth.
New Jersey,	Albert P. Brown, cor. Fifth and Federal streets,	Camden.
	John B. Drake, 132 Broad street,	Elizabeth.
	Hermann Klussmann, Fourth street and Lafayette avenue,	Hoboken.
	Maxwell Abernethy, 188 Newark avenue,	Jersey City.
	Charles B. Smith, 831 Broad street,	Newark.
	Robert E. Parsons, 19 Main street,	Orange.
	William H. Voorhees, 21 West Front street,	Plainfield.
	G. A. Mangold, 4 East State street,	Trenton.
New York,	Charles H. Gaus, 202 Washinington avenue,	Albany.
	G. C. Close, cor. Smith and Schermerhorn streets,	Brooklyn.
	Charles O. Rano, 1872 Niagara street,	Buffalo.
	William L. Du Bois, 281 Main street,	Catskill.
	James T. King. cor. Main and South streets,	Middletown.
	Daniel C. Robbins, 91 Fulton street,	New York.
	H. S. Sherwood, 339 Main street,	Poughkeepsie.
	G. H. Haass, 38 Main street,	Rochester.
	John G. Bissell, 45 Dominick street,	Rome.
	Charles F. Fish, 114 Broadway,	Saratoga.

	George E. Duryee, 191 State street,	Schenectady.
	Charles W. Snow, 28 East Genesee street,	Syracuse.
	William Blaikie, 202 Genesee street,	Utica.
Nevada,	William A. Perkins, 213 Main street,	Virginia City.
North Carolina,	William Simpson, 33 Fayetteville street,	Raleigh.
	James C. Munds, Third street,	Wilmington.
Ohio,	Andrew M. Armstrong, 106 East Market street,	Akron.
	Walter H. Howson, Water street,	Chillcothe.
	J. U. Lloyd, N. W. cor. Court and Plum streets,	Cincinnati.
	Henry C. Gaylord, 110 Monument square,	Cleveland.
	Charles Huston, 43 South High street,	Columbus.
	Thomas J. Casper, 41 East Main street,	Springfield.
	Charles Hohley, 248 South street,	Toledo.
	Edgar M. Hatton, Fifth and Main streets,	Zanesville.
Pennsylvania,	Edward T. Myers, 16 Main street,	Bethlehem.
	Jacob A. Miller, cor. Second and Chestnut streets,	Harrisburg.
	Charles A. Heinitsh, 16 East King street,	Lancaster.
	Joseph L. Lemberger, 8 North Ninth street,	Lebanon.
	Francis W. Walker, Jr.,	New Brighton.
	Rich. M. Shoemaker, cor. Fourth and Race streets,	Philadelphia.
	James B. Cherry, 23 Fourth avenue,	Pittsburgh.
	Philip M. Ziegler, 526 Penn street,	Reading.
	Edward A. Cornell, Tenth and Pine streets,	Williamsport.
Rhode Island,	James H. Taylor, 104 Thames street,	Newport.
	Albert L. Calder, 163 Westminster street,	Providence.
South Carolina,	Gustavus J. Luhn, Post-office box No. 582,	Charleston.
Tennessee,	Jas. S. Robinson, cor. Third and Madison streets,	Memphis.
	John C. Wharton, 38 Union street,	Nashville.
Texas,	Thomas W. Powell, 10 Houston street,	Fort Worth.
Virginia,	Frederick H. Masi, cor. Main and Granby,	Norfolk.
	T. Roberts Baker, 919 East Main street,	Richmond.
West Virginia,	Edmund Bocking, 1 Odd Fellows' Hall,	Wheeling.
Wisconsin,	Edward B. Heimstreet,	Janesville.
	John R. Drake, 255 South Water street,	Milwaukee.
Prov. Nova Scotia,	Francis C. Simson,	Halifax.
Prov. Ontario,	George Hodgetts, 305 Yonge street,	Toronto.
Prov. Quebec,	Henry R. Gray, 144 S. Lawrence Main street,	Montreal.

LIST OF QUERIES.

TO BE ANSWERED AT THE THIRTY-SECOND ANNUAL MEETING, 1884, TO BE HELD AT MILWAUKEE, WIS.

No. 1. What is the proportion of water of hydration in the quinine of commerce? A paper on the subject is desired.

Accepted by H. B. Parsons, New York.

2. The practicability of Kerner's Test.

Accepted by H. B. Parsons, New York.

3. Jequirity Seeds (Abrus precatorius). A paper on the subject.

Accepted by T. Roberts Baker, Richmond, Va.

4. On Copalchi Bark.

Accepted by Prof. C. Gilbert Wheeler, Chicago.

5. A paper on the tests for Brucine in presence of Strychnine, and for Strychnine in presence of Brucine, is desirable. Also a plan for the perfect separation of the alkaloids.

Accepted by Prof. A. B. Prescott, Ann Arbor.

6. How does the present U. S. P. process for assaying opium compare with others as to accuracy in thoroughly exhausting the drug of morphine?

Accepted by Prof. Wm. W. Bartlet, Boston.

7. Can the present U. S. P. process for the preparation of diachylon ointment be improved upon? If so, suggest a better.

Accepted by Leo Eliel, South Bend, Ind.

8. What is the best method of preserving mucilage of acacia?

Accepted by Albert E. Ebert, Chicago.

9. In the preparation of the oleates, which produce the most satisfactory products, those made from oleic acid or those made from soap?

Accepted by C. S. Hallberg, Chicago.

10. Should lactate of iron have any odor?

Accepted by Prof. O. Oldberg, St. Louis.

11. An examination of the Spanish saffron of commerce.

Accepted by Prof. J. M. Maisch, Philadelphia.

12. What is used to adulterate yellow beeswax, and what is sometimes sold as yellow beeswax?

Accepted by Prof. Chas. Caspari, Jr., Baltimore.

13. Pharmacists often have the price of cream of tartar sold by grocers thrown up to them as a standard of the value of this substance. What proportion of the cream of tartar sold by grocers will conform to the U. S. P., and also that sold by druggists?

Accepted by Geo. W. Kennedy, Pottsville, Pa.

14. Is the formula of our new Pharmacopœia for making solution of nitrate of iron satisfactory? Will the preparation keep?

Accepted by Prof. Oscar Oldberg, St. Louis.

15. Will the chloroform of commerce conform to the requirements of the U. S. P.?

Accepted by Prof. P. W. Bedford, New York.

16. Is pure oleic acid for the preparation of oleates equal to an acid which contains a portion of stearic acid?

Accepted by B. F. McIntyre, New York.

17. An essay on the medicated waters according to the Pharmacopœia of 1882 is desirable. What advantage, if any, has the new Pharmacopœia process for making them over those of the preceding Pharmacopœia? What position do pharmacists generally take in the matter?

Accepted by Robert H. Cowdrey, Chicago.

18. Is there a necessity for evaporating extract of malt to the consistence of a solid extract; and if so, what is the advantage?

Accepted by Albert E. Ebert, Chicago.

19. It is said that essential oil of mustard seed of the market consists of two kinds, one made from the seed and the other made artificially. Information on this subject is desired.

Accepted by Charles Rice, New York.

20. Is the sulphate of quinine imported into this country and sold in bulk, equal to that of our manufacturers?

Accepted by M. N. Kline, Philadelphia.

21. To what extent does the iodine supply depend on the supply of kelp?

Continued to Prof. P. W. Bedford, New York.

22. Are commercial volatile oils adulterated to any extent? What is generally used as the adulterant?

Accepted by G. H. C. Klie, St. Louis, Mo.

23. Ethereal oil of male fern deposits a sediment. Is the sediment or the overlying oil the desirable portion?

Continued to Charles F. Hartwig, Chicago.

24. What proportion of the cinchona barks of commerce will answer the pharmacopœial tests? Give particulars.

Continued to H. B. Parsons, New York.

25. Are the compound cathartic pills of commerce prepared in accordance with the Pharmacopœia?

Accepted by S. H. Stevens.

26. Lead plaster and other plasters of the United States Pharmacopœia become hard

and brittle by keeping. How can their soft consistence, as when freshly made, be preserved?

Continued to Hugo W. C. Martin, Chicago.

27. It has been asserted that some pharmacists pay percentages to physicians who send prescriptions to their stores. Is this true to any great extent? What is the feeling of the pharmacists of our country regarding the matter, and the feeling of physicians?

Continued to Hugo W. C. Martin, Chicago.

28. The alkaloid berberine is by some writers claimed to be nearly insoluble, while another claims it is freely soluble in water. This discrepancy in statements should be investigated.

Continued to O. Eberbach, Ann Arbor.

29. What is the chemical nature of the acrid principle of mezereon bark?

Continued to O. Eberbach, Ann Arbor.

30. Is brucine poisonous? Dr. Garrod has stated that it is not.

Accepted by Robert Bartholomew.

31. What is the nature of the crystalline precipitate which forms in tincture of Boletus Laricis?

Continued to C. W. Phillips, Cincinnati.

32. What menstruum is best adapted to extract and hold in solution the desirable principles of licorice root?

Continued to F. F. Prentice, Janesville, Wis.

33. Does the brucine of commerce contain strychnine? An examination of the brucine of commerce is desired.

Continued to S. A. D. Sheppard, Boston.

34. Good authority states that artificial salicylic acid is now used in making oil of wintergreen, and that this artificial oil is cheaper than the natural. To what extent is this true?

Accepted by Adolph W. Miller, Philadelphia.

35. What is the quality of the narcotic herbs of commerce?

Continued to C. S. Hallberg, Chicago.

36. To what extent, if at all, is it proper for physicians to specify in their prescriptions the particular make of preparations prescribed by them?

Accepted by Prof. Otto A. Wall, St. Louis.

37. Does oil of thyme made years ago contain a larger proportion of thymol than that of the present day?

Accepted by Prof. Joseph P. Remington, Philadelphia.

38. The source and supply of indigenous drugs?

Continued to C. B. Allaire, Peoria.

39. What should be the relation between wholesale druggists, manufacturing chemists, and pharmacists and dispensing pharmacists, as to the maintenance of proper standards of purity, quality and strength of medicinal substances?

Accepted by Prof. Oscar Oldberg, St. Louis.

40. Is it proper to prepare tinctures, wines, syrups, decoctions, infusions, etc., from fluid extracts; and if so, to what extent?

Accepted by Prof. Otto A. Wall, St. Louis.

41. Examine the bromide of potassium of commerce.

Accepted by Virgil Coblentz, Springfield, O.

42. A paper on sassafras camphor.

Accepted by S. A. D. Sheppard, Boston, Mass.

43. What is the quality of the belladonna leaves of commerce?

Accepted by B. F. McIntyre, New York.

44. The crystalline form of the white alkaloid of Hydrastis Canadensis.

Accepted by Virgil Coblentz, Springfield, O.

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PREFATORY NOTICE.

ARRANGEMENTS for the printing of the Proceedings could not be made until December, 1883, when the last of the manuscript reached the editor. Most of the wood-cuts used in the Report on the Progress of Pharmacy were, as for previous volumes, loaned by the publishers of New Remedies, and of the American Journal of Pharmacy, and those illustrating the paper on Precipitates in Fluid Extracts were furnished by the author, Professor Lloyd. In the meantime a General Index had been prepared, and it was contemplated to issue this with the present volume; but it was found that this would cause a much greater delay than was at first supposed. The book, therefore, appears without this General Index, which will be published with the next volume.

The frontispiece of this volume is the portrait of Dr. John William Neergaard, who, although never prominent as author or speaker, was well known to those members who met him at the annual meetings, from which he was rarely absent, and who was greatly respected for his high aims, his pure principles, and his sterling qualities as a man and as a pharmacist. He was born at Copenhagen, Denmark, in 1810, passed the examination as assistant pharmacist in 1828, and as apothecary in 1831; came to the United States in 1840, and then resided in the city of New York until the time of his death, May 25, 1880. A brief sketch of his useful life will be found on page 497 of the Proceedings for 1881.

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All orders for Proceedings should be addressed to the Permanent Secretary, John M. Maisch, 143 North Tenth street, Philadelphia, Pa.

The Thirty-second Annual Meeting will be held in Milwaukee, Wisconsin, on the last Tuesday (26th day) of August, 1884. Blank applications for membership may be obtained from the Authorized Agents, or from the Permanent Secretary. Applications properly filled should reach the Chairman of the Committee on Membership, George W. Kennedy, Pottsville, Pa., on or before August 16th; if sent later, they should be addressed to the Local Secretary, Henry C. Schranck, 437 East Water street, Milwaukee. The fees should be sent in postal money order, in draft, or in bank check.

LIST OF MEMBERS AND DELEGATES IN ATTENDANCE AT THE THIRTY-FIRST ANNUAL MEETING.

Names of Delegates are indicated by an asterisk (*).

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PROCEEDINGS

OF THE

THIRTY-FIRST ANNUAL MEETING

OF THE

American Pharmaceutical Association.

REPORT ON THE PROGRESS OF PHARMACY.

FROM JULY 1, 1882, TO JUNE 30, 1883.

BY C. LEWIS DIEHL.

The report submitted with this is believed to be a very fair exponent of pharmaceutic progress during the past year, and will be found to present the accumulated facts and observations as clearly and concisely as was possible during the time allotted to the task. It is by no means an easy task to condense voluminous papers, so that a clear synopsis may be given, or that important facts shall not now and then be omitted; and it is therefore quite possible that the report may suffer as much from too great brevity as from too voluminous extraction. The reporter, having with this completed his tenth report since the establishment of his office (in reality the eleventh consecutive report, and in all the thirteenth), has in each report endeavored to improve upon that previously made—in point of fact, he has endeavored to make his report as complete as the "Jahresberichte" of the Germans. That he has never succeeded in this cannot be surprising when it is remembered that the "Jahresberichte" are the result of the joint labors of several persons, each of whom is probably selected on account of his special qualifications for the portion assigned to him. In this case, the report is made by one person only, who is at the same time actively engaged in the business of dispensing medicines, and who can only devote such time to it as others devote to recreation and rest. To the majority of the members of the Association this explanation is, perhaps, unnecessary, and the difficulties under which the report is made are well understood; but others, and particularly commentators outside of the Association, appear not so well informed, and are therefore asked to take into consideration the conditions under which this report is made, if they should find it incomplete.

In accordance with the intention expressed in last year's report, the system of cross-reference has been maintained in this, and is believed to be very complete.

PHARMACY.

A. Apparatus and Manipulations.

WEIGHTS, MEASURES, ETC.

Weights and Measures.—Defective Quality in England.—The "Pharmaceutical Journal" of December 16th, 1882, speaking of an examination that had lately been made of the weights and measures used by the pharmacists in an English city, says: The shops visited were twenty-four in number; in only 4 instances were all the weights and measures found correct, and in 16 cases summonses were issued and convictions followed. Altogether 1,207 weights and 127 measures were examined. Of the weights, 128 were found too light, 97 were too heavy, and 59 were illegal only in being unstamped. Of the measures, 31 were found incorrect. There were also 54 scales tested and 17 proved untrue. The nature and extent of the default may be seen from the following table, setting out the amount of error in the weights seized in two cases in which convictions were obtained.

First Case.

Denomination of Weight.	*Error.*
6 grains	$\frac{9}{10}$ gr. light.
5 grains	$\frac{2}{10}$ gr. light.
4 grains	1 gr. light.
2 drachms	$1\frac{1}{2}$ gr. heavy.
2 scruples	$\frac{3}{10}$ gr. heavy.
1 scruple	$\frac{3}{10}$ gr. heavy.
½ scruple	$\frac{6}{10}$ gr. heavy.

Second Case.

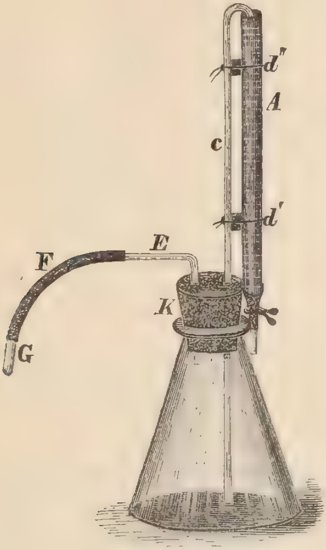
Denomination of Weight.	*Error.*
6 grains	$\frac{9}{10}$ gr. light.
5 grains	$\frac{4}{10}$ gr. light.
4 grains	$\frac{4}{10}$ gr. light.
3 grains	$\frac{7}{10}$ gr. light.
1 grain	$\frac{3}{10}$ gr. light.
2 drachm	$\frac{5}{10}$ gr. heavy.
1 drachm	$\frac{4}{10}$ gr. heavy.
½ drachm	$\frac{5}{10}$ gr. light.
1 scruple	$\frac{6}{10}$ gr. heavy.
½ scruple	$\frac{3}{10}$ gr. heavy.

—New Rem., Feb. 1883, 57.

Prescription Scales and Weights.—Mr. William P. Thompson makes some admirable remarks on the character and use of prescription scales and weights, for which see Am. Jour. Phar., Feb. 1883, 78–80.

Volumetric Apparatus—Simple Construction.—A simple apparatus for titration, particularly suitable for acidimetric and alkalimetric assays, is that which has been used since 1880 in the laboratory of the technical school at Braunschweig, and which is illustrated by Fig. 1. *B* is an Erlenmeyer flask, which serves as receptacle of the volumetric solution. *K* is a twice perforated rubber stopper, carrying in one of its perforations a glass tube reaching to the bottom of the flask, *B*. The upper end of the tube, *C*, is curved, and projects into the burette, *A*. In order to make the arrangement sufficiently secure, the burette is fastened to the tube, *C*, by means of the two corks, *d* and *d'*, and a cord. Through the second perforation of the stopper, *K*, passes a glass-tube, *E*, bent at right angles, over which a piece of rubber-tubing, carrying a small glass mouth-piece, is slipped. When the burette is to be filled, air is blown into the rubber-tube, whereby the volumetric solution is made to rise in the glass-tube, *C*, and flows into the burette.

FIG. 1.



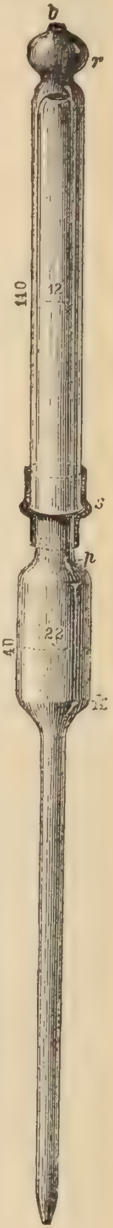
Volumetric Apparatus.

The advantages of this arrangement are self-evident, for, in the first place, it can be easily carried without having to be taken apart, and secondly, the burette can be filled with the greatest ease. The objection that the blowing in of air may cause carbonic acid to be absorbed by volumetric solution of alkalies, may be overcome by interposing between the mouth-piece and the flask itself, a so-called potash-tube. Experiments made to test the permanency of the titer, have shown that it is not altered by as much as 0.1 *cc.*, even when standing four weeks.—New Rem., May 1883, 135, from "Drogisten Zeitung."

Burettes—Manufacture and Correction.—Dr. Wilh. Ostwald has contributed a valuable paper on the manufacture and correction of burettes to "Jour. f. prakt. Chemie" (1882, 452), which is translated and reproduced in New Rem., Oct. 1882, 306–308.

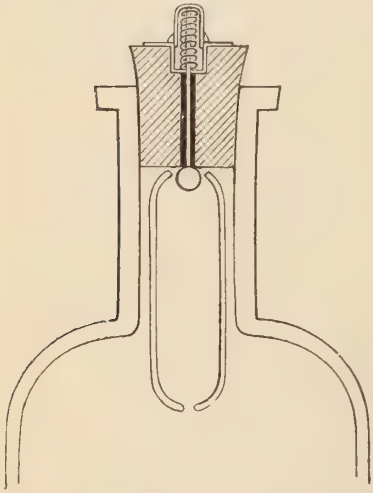
A New Form of Pipette.—Mr. Arthur Meyer describes a new form of pipette (see Fig 2), such as is at present frequently used for removing layers of ether or amylic alcohol in chemical laboratories. It is made of glass, and the figures indicate the size of the different parts in millimeters. At the top, *o*, the outer tube has an opening about two millimeters in diameter. When using the pipette, the opening is closed with the index finger of the right hand, while the tube *r* is clasped by the thumb and middle finger, and thus drawn up. At the lower end of *r*, a piece of rubber tubing is attached, which fits the tube *p* snugly, and should be slightly moistened before using the pipette. Whenever the bulb *k* is filled with liquid, by drawing the tube *r* upwards, the pipette may be emptied by removing the index finger.—New Rem. Dec. 1882, 363, from Arch d.Pharm., July 1882, 524.

FIG. 2.



A New Measuring Stopper.—Mr. B. B. Lewis has invented a device for measuring medicines or other fluids, which is shown by Fig. 3. It consists of a glass vessel, open at both ends and attached to the stopper in such manner that the fastening forms a valve for one opening and holds the device securely in the neck of the vial or bottle. By turning the vial upside downward and pressing on the button, the hole nearest the stopper is opened, and as the air in the measuring tube escapes through the opposite opening, the fluid will take its place. The pressure on the button then being removed, and the vial restored to its upright position, the stopper with the measuring vessel and its contents can then be removed. By pressing again on the button, air enters the upper opening and the liquid flows out of the one below.—New Rem., Oct. 1883, 305.

FIG. 3.



Lewis's New Measuring Stopper.

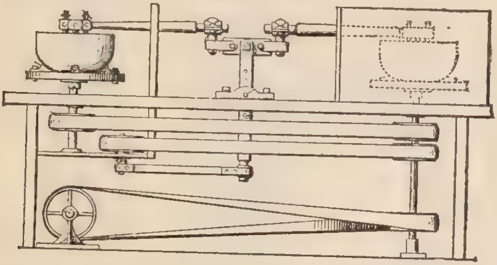
MECHANICAL DIVISION, ETC.

Fineness of Powders for Percolation.—"The Druggist" for March 1883, makes the following observations in reference to powders required for percolation: "It is not probable that a majority of the pharmacists who attempt to produce their own preparations ever succeed in attaining the degree of fineness directed by the

Pharmacopœia for the process of percolation. An experience of many years with various mills adapted for a small laboratory convinces us of the impracticability, not to say impossibility, in many cases, of reducing roots and barks to such a state of division as to pass through sieves having 80 or 60 meshes to the linear inch, desirable as this may be. And even if a portion of the drug be actually ground to fine powder in a hand-mill, a large proportion will resist comminution." "The only alternative, if one declines to purchase the ground drugs, is carefully to dry the drug at about 120° F. in a suitable oven (the baking oven sold with all the oil stoves at present is exceedingly useful for the purpose), and then to endeavor to procure two or three grades of powder, as the case may be. These are to be moistened separately, and packed in the percolator in layers, with the finest as the bottoms, ending with the coarse, woody, fibrous matter on top."—New Rem., May 1883, 157.

Triturating Machine—Novel Construction.—A new triturating machine, (see Fig. 4) in which the forms of mortar and pestle are still retained, has been constructed by Messrs Bœricke and Tael. The mortar is clamped to a revolving platform in such manner that it can readily be detached when needed, and a reciprocating lever imparts a to-and-fro movement to a gang of four pestles, which are arranged so that the distance which they go over, back and forth, can be varied by changing the fulcrum of the oscillating lever. By means of a hinge-joint at the extremity of the cross-head, the beam carrying the pestles can be raised and the pestles removed from the mortar whenever it becomes necessary to manipulate the contents of the latter. An ingenious and simple contrivance is used to insure contact of all the pestles with the sides and bottom of the mortar, as the former travel back and forth across its concave floor. This consists in making the shanks or handles of the pestles square, and passing them through corresponding holes in the end of the horizontal beam. The holes are a trifle larger than the square handles, and the latter are thus permitted to rise and fall independently of each other and of the horizontal beam, thus enabling them to adapt their grinding surfaces to the varying

Fig. 4.

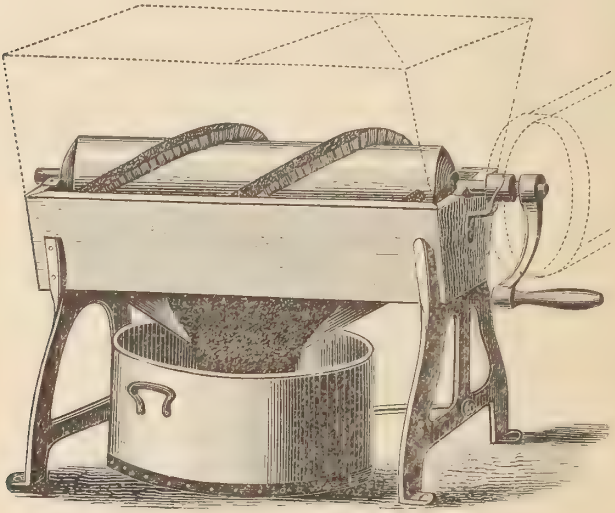


Bœricke and Tael's Triturating Machine.

inequalities of the floor of the mortar. The apparatus is so arranged that each reciprocating shaft will give motion to two sets of mortars and pestles. To prevent the access of air or the escape of the substances undergoing trituration, each mortar is provided with a cover that can be removed when desirable.—New Rem., Jan. 1883, 11.

Mixing and Sifting Machine—New Construction.—The machine illustrated by Fig. 5 is the invention of Mr. Zemsk, and attracted considerable attention at the meeting of the German Pharmaceutical Association, held in Berlin in 1882. The sifting tissue is a half cylinder of wire gauze, easily removable and exchangeable for others with larger or smaller perforations. The brush-cylinder is adjustable to various distances from the gauze, so that the bristles will remain useful even when worn to stumps. The diagonal arrangement of the brushes, with the rotary action of the cylinder, seem admirably calculated to mix various powders and to break down the lumps.—New Rem., Feb. 1883, 41.

FIG. 5.



Mixing and Sifting Machine.

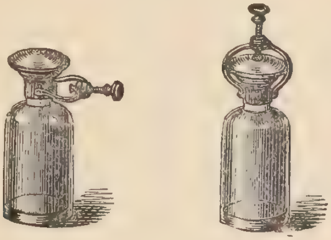
SOLUTION, PERCOLATION, ETC.

Dialysis—New Observations.—Mr. Woellmer communicates the following observations respecting dialysis: If a liquid which is to be dialysed is poured into a dialyser covered with a bladder, and this liquid as well as that contained in the exarysator (the surrounding vessel) be occasionally stirred during the day, it will be noticed that the dialysis is interrupted on the third or fourth day, the membrane becoming covered with a slimy liquid. If the bladder, after complete cessation of dialysis (about 8 days), be replaced by parchment paper, the dialysis begins afresh, and a good deal more can be dialysed through. Parchment paper, however, does not permit an absolute separation of crystalloids and colloids; and it may even be asserted that any substance which is sufficiently fine may pass through the pores of the parchment paper, and that, therefore, dialysis through parchment paper is merely a filtration in a more circumscribed sense. Animal membrane, on the other hand, only permits the passage of substances in solution; but even here it is scarcely possible to draw a sharp line between colloids and crystalloids, since substances pass through the membrane which are far from having the properties of crystalloids. It would appear from these observations that animal membranes alone should be used in dialysis.—New Rem., Aug. 1883, 236; from Pharm. Zeitg. and Pharm. Post.

Dialysis—Review.—Mr. Byron F. McIntyre communicates an interesting review of the history and development of the dialytic process, which see in New Rem., Jan. 1883, 2–3.

Digestion Bottles—Construction.—In the course of a paper on some assay process of the new German pharmacopœia, in which it is necessary to digest a mixture for the purpose of setting iodine free, Mr. Paul Lohmann recommends the use of special bottles, provided with accurately ground stoppers and with an arrangement for securing the stopper in its place, as shown in the cut (Fig. 6). This arrangement prevents the loss of vapors by an accidental lifting of the stoppers. New Rem., Mar. 1883, 68.

FIG. 6.

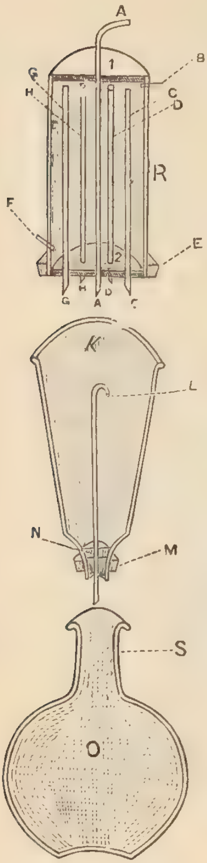


Digestion Bottles.

Improved Extraction Apparatus for Laboratories.—Messrs. Wegelin and Huebner have placed on the market a new and very compact extraction apparatus, which is suitable for the purposes of the laboratory, to make experiments, assays, or any other determination on a small scale. The apparatus, suitably illustrated, is described in New Rem., May 1883, 137.

Extraction Apparatus—Cheap Construction.—Mr. Charles O. Currier describes the apparatus illustrated by Fig. 7, which merits attention by reason of its simplicity, cheapness, and large condensing surface. It consists of a glass flask, O; glass-percolator, K; and a condenser, R. The condenser is the only part that will have to be made; the other parts of the apparatus are to be found in almost every laboratory. The condenser is a modification of the Liebig condenser, consisting of a number of tubes instead of one, thereby increasing the condensing surface and distributing the condensed liquid evenly over the surface of the drug. The condenser is made in the following manner: A tube of tinned copper is made one inch less in diameter than the top of the percolator to be used, and about two or three times as long as its diameter. A cap of tinned copper (tinned side out) is fitted to each end of the tube. The tube is traversed by tin tubes (made by cutting off block-tin pipe to the proper length) that project three-fourths of an inch below the lower cap, and are cut off obliquely to facilitate the dropping of the condensed liquid. One of the tubes A is in the centre, and passes through the upper cap about six inches, to which a bent safety-tube may be attached to prevent undue pressure to the apparatus. The other tubes, G, H, C, D, are closed at the top and pass into the condensing tube to within one-half inch of the top, and are arranged in a circle around the central one. Their number can be increased or diminished according to the size of the apparatus, four or five being sufficient for a pint percolator. Holes for these tubes should be made through the lower cap just the size of the tubes, and the tubes soldered to the cap, 2, on the inside before the cap is soldered to the condensing tube. A small brass tube F is inserted in the condenser near the bottom and one near the top, B, for the entrance of cold water and exit of warm water. A cork is chosen that will fit tightly into the top of the percolator, and a circular piece cut out of it, just the size of the condenser R, and is put upon the lower part of it at E. The cork can be kept in place and prevented from slipping up the tube when pressing into the percolator by soldering a collar of tin to the condenser at a distance from the bottom equal to the thickness of the cork.

Fig. 7.

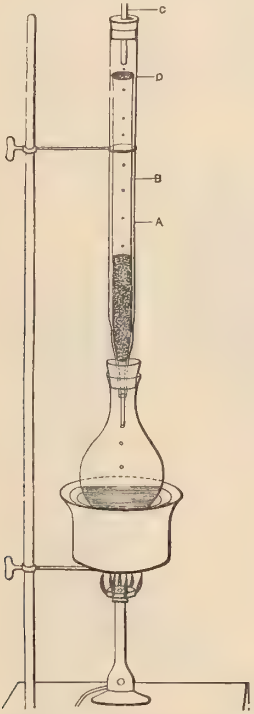


Extraction Apparatus.

The apparatus is used in the following manner: A cork, N, with longitudinal channels cut in its surface, is inserted in the neck of the percolator, K; through the centre of the cork, a glass-tube, L, is passed to within two inches of the top of the percolator. The tube should be bent over at the top, to prevent its being clogged up by the drug while packing it into the percolator. A little cotton is placed in the percolator and pressed down upon the cork, and the drug packed in the usual manner. The percolator is then fitted into the neck of the flask O, by means of a perforated cork M, the liquid to be used as a menstruum having been previously put in the flask. The condenser is then connected firmly with the top of the percolator. The joints are luted with ground flax-seed mixed into a stiff paste with water. The tube F is connected with a supply of cold water by means of a rubber pipe, and the tube B with a sink or waste-pipe. The apparatus thus put together is placed in a water-bath and the heat applied. The flask should be immersed in the water to the point marked S on the neck. After the drug is exhausted the percolator is removed from the flask and the flask is connected by means of a bent tube with a Liebig's condenser, and the liquid recovered.—New Rem., May 1883, 130.

Apparatus for Continuous Extraction—Modification of Tollens' Construction.—Messrs Wyndham R. Dunstan and F. W. Short having exper-

FIG. 8.

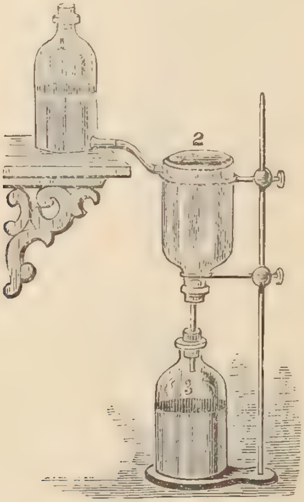


Dunstan and Short's Apparatus for Continuous Extraction.

ienced many difficulties in the use of B. Tollens' apparatus for continuous extraction have constructed and recommend the one illustrated by the accompanying cut (Fig 8). It consists of two tubes, *A* and *B*, the larger one being drawn out at one end to such a diameter as will admit of the smaller tube, which is also drawn out, passing through it. The outer tube is indented on each side (by pressing when red hot by means of crucible tongs), by which means two ledges are formed within the tube, which serve as supports for the smaller tube. It is important that the tube *A* be not too long, or the vapor will be condensed to a greater or less extent in this tube before reaching the condenser *C*. The substance to be exhausted is placed in the inner tube, the narrow end of which has previously been plugged with a piece of cotton. A wire-gauze cap, *D*, fits upon the other end of this tube and prevents possible ejection of the substance, though generally it may be dispensed with. The outer tube is now connected with a flask by means of a cork, and the open end is fitted with a cork bearing a long tube, C, which acts as a condenser. The use of the apparatus is obvious, and requires no further description, though the authors draw attention to some points in this connection which may be profitably consulted.—Phar. Jour. Trans., Feb. 17, 1883, 663–665.

Apparatus for Percolating with Ether—Simple Construction.—John Calvert describes the following simple apparatus for making ethereal tinc-

FIG. 9.



Calvert's Apparatus for Percolating with Ether.

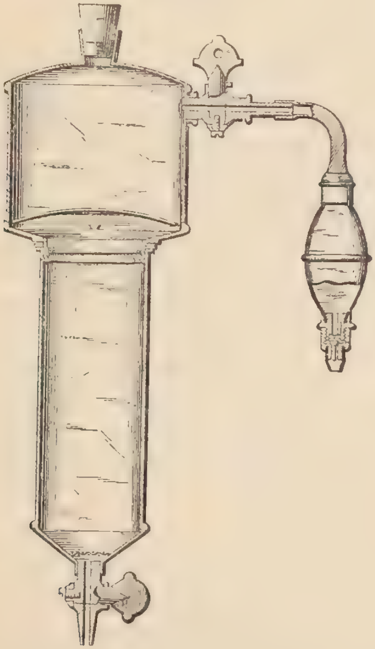
tures, etc., by percolation (see Fig 9.) Vessels 1 and 2 are ordinary quart douche bottles; No. 3 is a common quart flask; Nos. 2 and 3 are fitted with corks through which one piece of glass tube is passed. No. 1 is the reservoir; No. 2 is the percolator; No. 3 is the receiver. The lower orifice of No. 1 is connected with No. 2 by means of a short piece of vulcanized rubber tubing.

The powdered substance to be extracted is introduced into the percolator (No. 2); a plug of tow is inserted in the neck, followed by the cork carrying the glass tube. The bottle is inverted and its contents packed as closely as possible, by gently slapping the sides of the vessel with the hand. The side orifice near the bottom of the percolator is then connected with the reservoir by means of the rubber tube. The reservoir stands on a shelf; the percolator is supported by the rings of a retort stand. The cork of the receiver is first slipped on to the glass tube of the percolator, and then brought down into the neck of the receiver. This cork should have a small escape-hole in it.

If a steady stream of the menstruum is desired, a small piece of glass tube is passed through the cork of No. 1, and connected, by means of rubber hose, with a similar piece through the cork of No. 3. Equilibrium is thus maintained.—Amer. Jour. Phar., May 1883, 269, from Proc. Cal. Phar. Soc., 1883, 40.

A New Percolator.—Mr. Samuel J. Hinsdale has devised the apparatus for percolation shown by Fig 10, which is intended to be adapted to the percolation of tinctures, syrups, extracts, and other fluids. A cylindrical

FIG. 10.



Hinsdale's New Percolator.

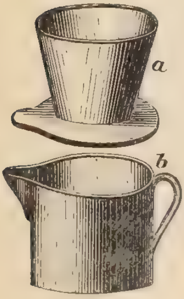
chamber, designed to receive the substance to be percolated, is provided near its lower extremity with a strainer and stop-cock. The upper end of this chamber is attachable to an air-chamber above it, the connection being made air-tight by means of screw threads and rubber gaskets. A convex diaphragm with marginal openings is located in the air-chamber near its connection with the cylinder below, and serves to deflect the menstruum when it is poured in through the orifice at the top, thus preventing the disturbance of the contents of the cylinder. Attached by a flexible pipe to the air-chamber is a bulb of rubber provided with valves, by the aid of which the tension of the air in the chamber can be increased, and the operation of percolation hastened.—New Rem., Jan. 1883, 9.

FILTRATION.

Upward Filter—New Construction.—Mr. Charles Symes, in connection with some very interesting remarks on "filtration," "filtering material," etc., draws attention to an "upward filter" of his construction, which combines upward filtration with the advantages of the motion tube. The apparatus consists of a plain tin cylindrical vessel with a tap-hole ½ inch from the bottom; it is 22 inches high and 8 inches diameter. A tin tray 7 inches in diameter, with a vertical rim 1 inch or 1¼ inch deep, has a hole in the rim; this and the hole near the bottom of the cylinder being fitted with a short female screw of the same pitch of thread. Over the tray the filtering material (flannel, calico, paper supported by muslin, or any other that may be suited to the liquid to be operated on) is tied securely; it is then inverted and placed in the cylinder so that the hole in the rim and the tap-hole are opposite one another. A tap with a bend at a right angle, is screwed in so that it holds the two together and assists a short leg in supporting the tray in position. To the end of the tap is attached an india-rubber, or a long glass tube turned on itself, the latter being attached by means of a short rubber tube. Obviously any communication between the tap and the contents of the vessel must be made through the filtering medium which covers the inverted tray, and any deposition which takes place must be on the bottom of the vessel itself or on the opposite side of the tray, but not on the filtering surface; and herein lies the special advantage of the filter, which is a modification of that constructed by Mr. Wm. R. Warner some years ago for filtering oils.—Phar. Jour. Trans., May 19, 1883, 937–939.

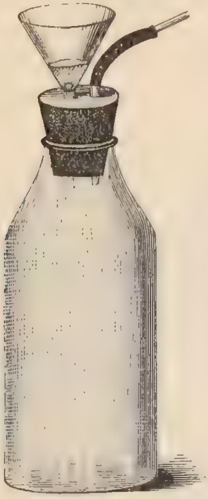
Filtering Apparatus for Syrups, Oils, etc.—The apparatus illustrated in the accompanying cut (Fig. 11) has been devised by Mr. Prikryl, and is intended for filtering syrups, oils, fats, extracts, etc. It is an iron vessel, with acid-proof enamel lining. The upper vessel has an open bottom, over which any straining cloth can be fixed, and is held fast by an India-rubber ring. The capacity of the apparatus described is eight litres for *a*, and ten litres for *b*.—New Rem., Feb. 1883, 50; from Zeitschr. Oest. Apoth. Ver.

FIG. 11.



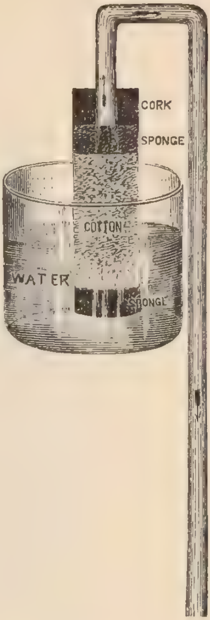
Prikryl's Filtering Apparatus.

FIG. 12.



Guenske's Syrup-Filtering Apparatus.

FIG. 13.



Filtering Apparatus.

Syrup-Filtering Apparatus—Simple Construction.—Mr. Guenske suggests an arrangement for filtering syrups which, he says, leaves nothing to be desired. He takes an ordinary calcined-magnesia bottle, fits its mouth with an India-rubber cork with a double bore, and, as shown in the engraving (Fig. 12), fits a funnel in one of the bores and a glass tube through the other. On the upper end of the glass tube a second small glass tube is connected by an India-rubber tube. Round the lower part of the funnel a piece of wire netting is arranged to support the filter and to prevent it bursting at the point. Then, when the syrup is poured in, and the filter damped all round, the air is sucked from the bottle by the mouth as completely as possible through the tube, and the India-rubber tube pinched together. The sucking is repeated each time that the syrup is poured into the filter. Mr. Guenske says that by this method he can filter three kilograms of syrup in an afternoon.—New Rem., May 1883, 148, from Chem. and Drugg.

Filtering Apparatus—Simple Construction.—A very simple apparatus for filtering water is that here described (Fig. 13). Take a glass tube about one yard long and of about one-fourth inch bore, and bend it twice at a right angle, as shown in the cut, so that the longer leg is about six times as long as the shorter. To the shorter leg is fastened, by means of a perforated cork, a wider glass tube, about 4¾ inches long and about ⅞ inch wide (inside); this tube is filled with absorbent cotton (freed from fat), a small piece of perfectly clean sponge being laid next to the cork, and a similar piece being used to close the other opening of the tube. In place of the narrow glass tube, a rubber tube may also be used. The apparatus is started like any other kind of siphon, and will be found to work well in all cases where the liquid is not too much loaded with suspended matters.—New Rem., Feb. 1883, 49.

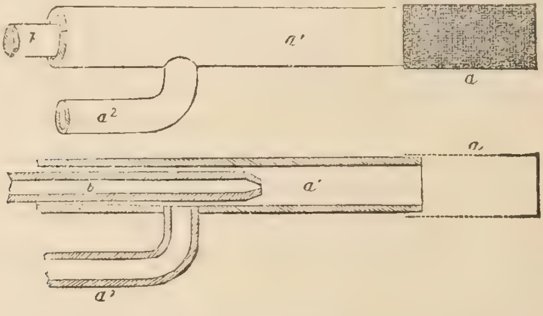
Asbestos Filter.—Method of making, etc., see *Asbestos*, under "Inorganic Chemistry."

APPLICATION OF HEAT, ETC.

A New Burner for Heat and Light.—Lewis Jacob has devised a new burner, which is capable of application for a variety of purposes. Its principle is based on the observation that a mixture of a combustible gas and of air, if somewhat compressed and ignited at the top of a suitable burner within a cage of metallic platinum or other refractory material, raises the metal to a point of incandescence, producing thereby a brilliant light, and, at the same time, an intense degree of heat.

The cap to be attached to the mouth of the burner is best made of platinum gauze or finely perforated sheet-platinum. In this case the utmost attainable degree of heat and light results. When the mixture is first ignited, the light is but feeble; but, as soon as the metal begins to become heated, the light increases and finally becomes very brilliant. The combustion, at the same time, is quite perfect, neither smoke nor other disagreeable products making their appearance. The most suitable pressure at which the air should be injected into the gas is about 2 pounds to the square inch. The annexed cuts show the arrangement of the burner, (Fig. 14), the elevation, and (Fig. 15) a section of the same.

FIGS. 14, 15.

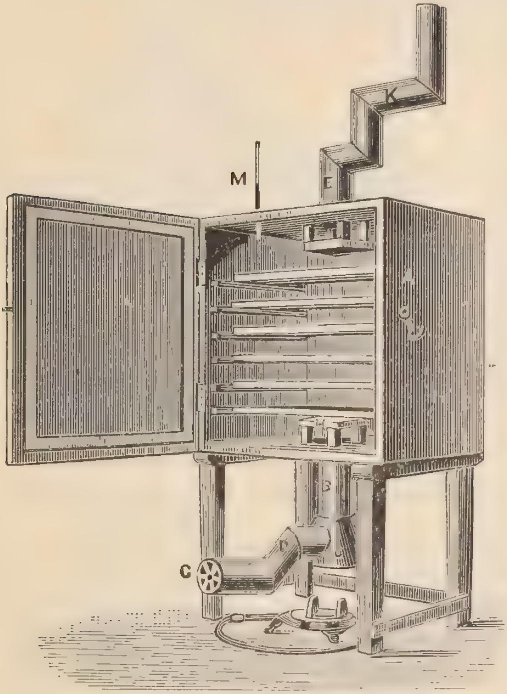


Jacob's New Burner for Heat and Light.

a is a cap of fine platinum gauze slipped over the end of the burner. The air or the gas, or both together, may be compressed in the tube a^1 or *b;* if they are compressed in *b*, their issuing from the orifice will attract an additional current of air from a^2.—New Rem., March 1883, 79, from "Il Progresso," Jan. 15, 1883.

Hot-Air Chamber for Pharmaceutical Purposes.—Mr. Thomas Maben draws attention to the hot-air chamber illustrated by Fig. 16, which he

FIG. 16.

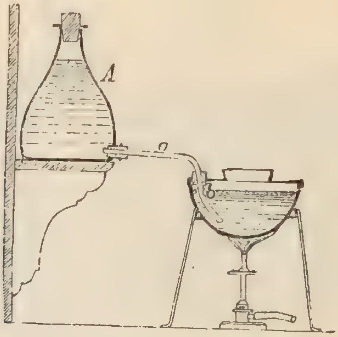


Maben's Hot Air Chamber.

finds admirably adapted for pharmaceutical purposes, and which is a modification of one designed originally by Mr. Hislop, one of his apprentices, who intended to use it for drying photographic gelatin plates. The chamber consists of a strong wooden box (*A*), 18 inches high by 18 inches wide, and 14 inches deep. The door may be hinged, as shown in the cut, but is more convenient if it is sliding. Wooden supports are fixed to the inner sides for the reception of teak spars serving as supports for trays, dishes, etc. The bottom of the box has a perforation of 3 inches in diameter, into which a zinc cylinder (*B*) is securely fitted; and to this is soldered the upper end of a copper cone (*C*) with a flat bottom, while into this latter a bent tube (*D*), diameter 2½ inches, and 9 inches total length, is securely inserted in the manner shown. A corresponding perforation is made in the top for receiving a tube to answer the purposes of a chimney. The source of heat is a Bunsen burner or spirit lamp applied to the bottom of the cone (*C*); the heat is diffused by means of the dispersion board (*H*) about 4 inches square, which is placed over the orifice, and is regulated by the "hit and miss" regulator shown at (*G*). A thermometer may be inserted at (*M*), and a rapid current is produced if the chimney, constructed as shown, is heated at the angle of the tube at (*K*).—Phar. Jour. Trans., March 31, 1883, 808.

Constant Level Water-Bath—Simple Construction.—Mr. Fr. Schimmel describes the following simple construction of a constant level water-bath which is illustrated by Fig. 17. A reservoir (*A*) of any desired capacity, filled with water and securely stoppered, is placed in a situation somewhat higher than the water-bath. From near its bottom projects a glass-tube (*a*) of about 7 mm. bore, which is curved and is fitted into the cover of the water-bath. At a place corresponding to the line at which it is desired to maintain the level in the water-bath, a round hole (*b*), corresponding to the full bore, is blown into the glass tube. As soon as the liquid in the water-bath sinks below the level of the hole *b*, air enters the reservoir, and water runs into the bath until the hole is below the level.—New Rem., Aug. 1882, 228; from Dingler's Polyt. Jour., 244, 150.

FIG. 17.

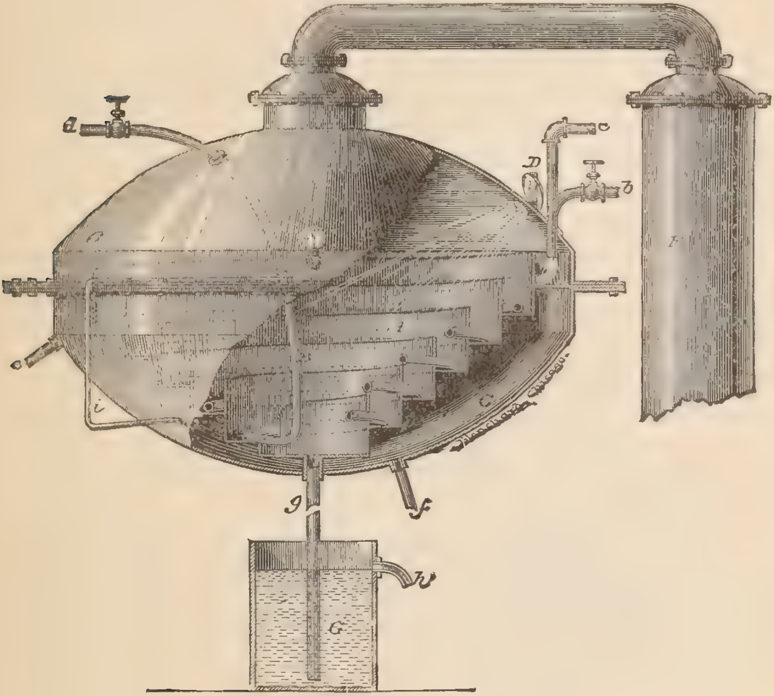


Schimmel's Constant Level Water-Bath.

Graphite-Bath—A Substitute for the Sand-Bath.—The use of sand for heating purposes, though used from time immemorial, is not wholly rational, sand being a very bad conductor of heat. Mr. Kristalta has lately recommended the substitution of pounded fragments of graphite: they let the heat pass much better, do not oxidize, and do not soil the inclosing vessel. "L'Electricité" commends the method to electricians who have to make researches in thermo-electricity, adding that small shot of iron would serve nearly the same purpose. For more intense heats, it is known, melted lead can be used.—New Rem., Feb. 1883, 53.

Improved Vacuum-Pan.—Mr. C. Wahl, of Chicago, has invented an improvement in vacuum-pans, which is intended to shorten the time during which the liquid to be concentrated remains in the pan. Its essential features are illustrated in Fig. 18. The pan is provided with the usual attachments: eye-glasses, D; a condenser, F; vacuum-gauger thermometer, etc.; but the liquid to be evaporated, instead of being filled into the pan in one bulk, passes gradually through the spiral-shaped canal or gutter, A. The space formed between this continuous channel and the bottom of the pan is used as a steam jacket, the heating capacity of which is increased by a coil of steam-pipe, B, running along on the bottom of the channel. *d* and *c* represent the inlets, and *e* and *f* the outlets for the steam. The liquid to be concentrated runs in at *b*, and after being concentrated, issues at *g*, and runs into a vessel, G, located about thirty feet below the vacuum-pan. Where the localities do not admit of this latter arrangement, the concentrated liquid must be pumped out, in which case, vessels to be used alternately will be found convenient for the reception of the concentrated mass. It will be seen that the operation of this pan is continuous, and that its working can be regulated with the precision of clockwork by the admission of liquid through the faucet *b*. While in the old style pans large batches containing up to fifty barrels are treated at the same time, being exposed to the high tempera-

FIG. 18.



Wahl's Improved Vacuum-Pan.

ture for hours and more; in Wahl's pan every drop, so to speak, is treated by itself, and leaves the pan after having attained the desired concentration, which is accomplished in a few minutes, owing to the effective application of heat, which has to penetrate a low column of liquid of one-half to two inches height at the utmost.—New Rem., Feb. 1883, 43.

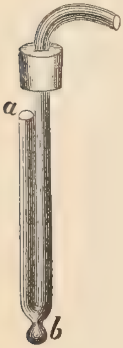
Small Distilling Apparatus.—Mr. Egrot, a French manufacturer of distilling apparatus, has constructed a small stationary still on the model of the larger ones manufactured by him, which is illustrated and described in "New Remedies," April, 1883, 105–106. The apparatus is particularly adapted to the strengthening of weak alcohol, and may doubtless find application in pharmaceutic laboratories in which large quantities of alcohol are recovered from fluid extracts, etc. The same manufacture, has constructed a

Steam Kettle, intended, primarily, for cooking with a view to avoiding the unequal heating of the contents of the kettle, such as occurs often when an open fire is employed. Such kettles, which are illustrated and fully described on page 107 of the same journal, would be serviceable for many pharmaceutical purposes.

An Apparatus for Simultaneous Distillation of a Number of Volatile Liquids, as used by the Experimental Institute for wine and fruit culture at Klosternenburg, near Vienna, is illustrated and described in "New Rem.," Aug. 1882, 231.

Apparatus for Subduing the Foaming of Certain Liquids during Distillation.—Dr. J. Lœwe has devised a simple contrivance, Fig. 20, by means of which the annoying foaming which takes place during the distillation of many liquids, particularly those containing recently formed alcohol, may be subdued.

FIG. 19.

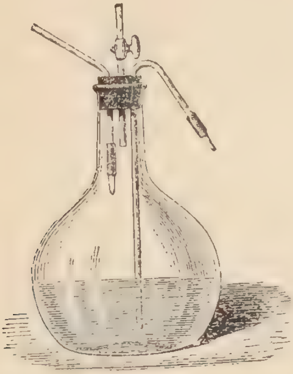


Instead of conducting the vapor of the distillation through the ascending portion of the glass tube passing through the cork in the neck of the flask, the glass tube is made to pass into the flask in the shape shown in the cut. A small bulb being blown in the centre of the bend, the two branches of the tube are adjusted close to each other, and the ascending portion cut off a short distance below the cork. The distance from the cork to the bottom of the bulb should be such that the bulb is only a few millimetres from the bottom of the flask when the cork is tightly inserted. During the boiling of the liquid any ascending foam or bubbles break when coming in contact with the cork, and the accompanying moisture flows down along the glass tube without entering the orifice at *a* to an appreciable extent. The calibre of the glass tube should not be too small, to avoid tension of the vapors in the flask.—New Rem., Feb. 1883, 42, from Dingl. Pol. Journ., 245, 219.

GENERAL LABORATORY OPERATIONS.

Hot Water Wash-Bottle—Construction—The wash-bottle illustrated by the accompanying cut (Fig. 21) is fitted with a triply perforated India-rubber stopper. One of the perforations contains the usual discharge-tube, and another the blowing tube. The latter is somewhat enlarged at the inner end, and is provided with one of Bunsen's India-rubber valves which only opens in the direction of the interior of the flask. The third perforation carries a glass-tube with stop-cock, the lower end of the tube being obliquely cut off. While the water is being heated, the stop-cock is opened to permit the escape of steam. When the wash-bottle is to be used the stop-cock is closed. The described arrangement causes the blowing tube to remain cool, and only a short blowing is required to cause a jet of water to be delivered. To arrest this, it is only necessary to open the stop-cock.—New Rem., Mar. 1883, 71, from Zeitsch. f. Anal. Chem., 1883, 60.

FIG. 20.



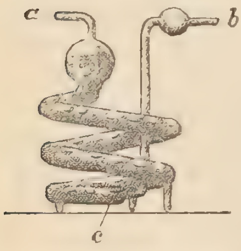
Hot Water Wash-Bottle.

Platinum Dishes—Repairing.—Mr. Garside, in the Chemiker Zeitung, reports his success in repairing a platinum dish as follows: A small platinum dish had in some way received an injury in the shape of a small hole near its centre. To repair it I first made a convex plaster cast of the dish, to serve as a sort of anvil. Next, I procured a piece of sheet platinum of three inches in diameter, and cleaned and polished the same thoroughly, as also the parts of the dish surrounding the opening. The dish being placed on the cast, the hole was covered by the piece, against which the flame of a stationary blow-pipe was now directed. A small scissors was used as a hammer. By softly hammering on the small piece, I succeeded after some time in combining the same completely with the body of the dish, so that it could hardly be noticed when not carefully examined. The dish could now be used again for all purposes, the mended spot holding out well. The plaster cast cracked in all directions, but retained strength enough for the purpose.—New Rem., Jan. 1883, 22.

Asbestos Capsules—Preparation.—J. Bering, desiring to obtain asbestos-plaster of a concave shape, so as to fit the external form of evaporating dishes or capsules, and not being able to procure such from any dealer, succeeded in preparing them from the flat asbestos plates of commerce as follows: The plate is covered in a flat-bottomed vessel with cold water, so that it is a few millimeters below the surface of the latter. After two, or at most three, minutes (a longer soaking would dissolve the binding material contained in the plates sold in trade), the plate is removed, and, after the water has drained off as much as possible, it is, while still moist, thoroughly rubbed with talc on both sides. A porcelain-capsule, corresponding in size to the asbestos-plate is then evenly pressed with the hand against the outside of the capsule, any wrinkles being smoothed down with some hard substance or with the thumb-nail. If the plate is to be made still more concave, it is afterwards pressed against the inside of the capsule, particular care being taken to press it evenly and to smoothen it near the bottom. The asbestos-capsule may now be dried by exposure to the air, or more rapidly, in an air-bath which is at first heated slowly, but afterwards as high as possible. It thereby becomes quite hard and acquires a "ringing" sound when it is struck with a hard substance. It is essential after soaking the asbestos-plate in water, to remove all air-bubbles, before pressing it into the desired form. Asbestos-capsules thus prepared form an excellent substitute for the sand-bath.—New Rem., Mar. 1883, 77, from Report d. Anal. Chem., 1882, 297.

Absorption Apparatus—New Construction.—When sulphuric acid is used as a drying medium for gases, it is generally used in this way, that fragments of pumice stone are saturated with the acid and packed in U-tubes, through which the gas is then made to pass. Yet, the filling, cleaning, and handling of these tubes is not free from objections. Winkler has now devised a new form of apparatus (Fig. 22) which is thought to save time and to permit even a still closer contact of the gas-bubbles with the acid than was possible in the U-tubes. The new spiral absorption-apparatus is formed of a spirally twisted tube of thin glass, which is expanded to a globe below the exit at *a*, and which is made to stand firmly on a level surface by means of three attached glass-legs. The current of gas is conducted into the apparatus through *b* and *c*, the latter being the finely-drawn-out point of the conducting tube, fused into the opening of the spiral tube. The gas being compelled to pass through this narrow opening, is thereby divided into fine bubbles, which, resembling a continuous string of pearls, ascend along the sloping top of the spiral. The latter being filled with sulphuric acid, each bubble is thereby thoroughly

FIG. 21.



Winkler's Absorption Apparatus.

brought in contact with the acid, particularly as each portion of the latter, after being displaced upwards by the ascending bubbles, falls back again and meets the succeeding bubble, and constantly keeps the inner surface of the glass tube moist. For the purposes of ultimate analysis, the apparatus may be made of glass tubing of 6 mm. in diameter, and in a spiral of 60 mm. outside diameter. The capacity then is a little over 10 cc., capable of taking up about 20 gm. of concentrated sulphuric acid, or 15 gm. of solution of potassa. Two of these spirals are connected with the combustion-tube, the first filled with the acid, the second with the potash. If substances containing *sulphur* are analyzed by combustion, the sulphuric acid may be mixed with a known quantity of chromic acid. The latter retains (by oxidation) the sulphurous acid passing over; and the quantity of the latter may be ascertained by finding the amount of undecomposed chromic acid by volumetric methods. For other purposes, the apparatus may be constructed of larger tubing, for instance, 20 mm. in diameter, and in larger spiral, say 200 mm. in outside diameter, in which case it will hold about 300 cc. of liquid.—New Rem., Feb. 1883, 40, from Zeitsch f. Anal. Chem., 1882, 546.

Apparatus for Sulphuretted Hydrogen—Improved Construction.—See *Sulphuretted Hydrogen* under "Inorganic Chemistry."

Apparatus for the continuous manufacture of *Bromine*, which see under "Inorganic Chemistry."

Apparatus for Illustrating the Manufacture of Sulphuric Acid.—See *Sulphuric Acid* under "Inorganic Chemistry."

A Novel Mode of Storing Packages has been devised by Mr. S. A. D. Sheppard. A drawer-like contrivance is constructed, which is calculated to contain an assortment of preparations so that they are protected from dust and light, are convenient for access, and at the same time occupy as little room as possible. A card with the name of the various articles kept in the drawer is attached to the front.—New Rem., Dec. 1882, 362.

Folding Paper Boxes—Construction.—A method for the construction of a new form of folding paper boxes is described in New Rem., Aug., 1882, 233. The description, which is explicit and accompanied by suitable illustrations, is taken from "Scientific American," and is supplemented by some practical hints by the editor of the "Gardener's Chronicle."

Proximate Analyses—Estimation of Ash.—The tedious operation of the estimation of ash in flour, wine, beer, extracts, etc., may be much facilitated by perfecting the combustion of the previously carbonized residue in a current of oxygen. The oxygen apparatus may consist of a test-tube, in which is placed a mixture of potassium chlorate and manganese dioxide, and the upper portion of which is filled with glass-wool, in order to prevent the escape of dust-like particles. The oxygen is conveyed through the perforated lid of a Rose crucible, the latter being first heated, and finally the test-tube. As soon as oxygen passes over, a violent combustion is produced, and the ash is very soon burned to whiteness.—Am. Jour. Phar., July 1882, 356, from Chem. Ztg., No. 24, 1882, and Phar. Centralh. 3, 188.

Thermo-Microscopy—Application in Pharmacy.—Mr. W. H. Symons draws attention to the advantage of the application of heat in the microscopic examination of certain substances, and contributes a lengthy paper giving the results of his studies in this direction. The method is useful in determining the melting points of certain substances, such as beeswax, paraffin, spermaceti, etc. ; for distinguishing between starches, and for determining certain resins, alkaloids, etc. The characters of distinction in the case of the starches are found in the temperature at which tumefaction takes place ; in the case of alkaloids, resins, waxes, and certain inorganic bodies—such as arsenious acid and calomel—these are found either in their melting or subliming points. The author describes apparatus devised by him, as well as the methods appliable to each case.—Phar. Jour. Trans., July 1 and 8, 1882, 1–4 and 21–22.

Test-Paper for Gaseous Ammonia.—See *Ammonia* under "Inorganic Chemistry."

Dilution and Mixture of Acids, Alcohol, Solutions of Salts, etc.—Mr. Th. J. Wrampelmeier has adopted and recommends the following as the most convenient and simple rule for diluting alcohol and acids, or making mixtures of intermediate strengths with such of higher and lower percentages :

"Having two solutions of the same substance and different per cent. strength (by weight) to make a solution of intermediate strength, mix them in the inverse proportion of the differences between their percentage strength and the percentage strength of the required mixture."

"Or, having two solutions strength P (for the stronger) and p (for the weaker) to make one of intermediate strength, p′, mix them in proportion of p′–p of the stronger to P–p′ of the weaker."

The author's paper is accompanied by examples, illustrative of the different cases that may arise.—New Rem., Jan. 1883, 1–2.

India Rubber Goods—Method of Preserving.—U. Kreusler, of Bonn, and E. Budge, of Constantinople, have obtained a patent for a mode of preserving rubber goods from hardening and cracking, which consists in steeping them for about a minute in melted paraffin, and drying in a room at a temperature of about 100°.—New Rem., Jan. 1883, 25.

Prescription Labeling.—Mr. S. A. McDonnel suggests the use of a varnish for preventing the defacement of the labels on vials containing acid mixtures.

The Label Varnish, which the author appropriately calls "label preserver" is made as follows:

℞.	Laccæ albæ	℥ j.
	Plumbi carbonatis	ʒ iv.
	Ætheris	Oss.

Place the white shellac in a mortar, and reduce to a moderately fine powder; then transfer to a bottle containing the ether, and set aside, shaking the bottle occasionally, until the powder resolves itself into a uniform solution; then add the lead, in fine powder; shake well, and filter through paper, returning the first portions of the filtrate, two or three times, until it comes through perfectly clear. To prevent the loss of ether, by evaporation, in the absence of a more suitable contrivance, while filtering, place four or five folds of paper on the counter, on which rests the bottle containing the funnel and the filter, over which place a ring-jar (or a tin-can)—one that will just fit being preferable to a much larger one—(the larger the jar the more space to be occupied by the ether vapor). Ordinary shellac may be used, but it imparts a brownish color to the labels.

The prescription being compounded, write and paste the label, and place it upon the bottle; smooth as usual (it is not necessary to wait until it dries); then, removing the cork, dip into the "Label Preserver" a rather bushy camel-hair pencil, and, withdrawing it, apply it to the label, in the direction of from top to bottom, in preference to crosswise; a single stroke to each untouched portion of the label (to prevent lapping, which shows when dry). The varnish dries very rapidly, and very little delay is occasioned by the process.—New Rem., May 1883, 139, from Proc. Cal. Pharm. Soc. and Coll. Phar., 1883, 42.

Paste for Labels, suitable for bottles, is made by soaking glue in strong vinegar, then heating to boiling and adding flour. The paste is very adhesive, and in a wide-mouthed bottle may be preserved without decomposition.—Zeitschr. Œst. Apoth. Ver., 1882, p. 435; from Polyt. Notizbl. in Amer. Jour. Phar., Feb. 1883, 103.

Varnish for Labels.—Sandarac, 53 parts; mastic, 20 parts; camphor, 1 part; oil of lavender, 8 parts; Venice turpentine, 4 parts; ether, 6 parts, and alcohol, 40 parts; macerate for several weeks, agitating frequently until dissolved, and decant or strain from the impurities. The varnish dries rapidly to a colorless, smooth, and glossy layer.—Rundschau, 1882, p. 686; from "Seifensieder," in Amer. Jour. Phar., Feb. 1883, 104.

Transparent Varnish.—Preparation.—The following formula for a transparent varnish is given in New. Rem., May 1883, 140:

Shellac, best bright orange, bruised	88 parts.
Shellac, bleached, bruised	176 "
Sandarac, powdered	16 "
Absolute alcohol	1000 "

Add the absolute alcohol to the mixed resins in a flask, add a little coarsely powdered glass, and shake the flask occasionally until all soluble matters are dissolved. Then set the flask aside for a month, pour off the clear solution, and filter the residue through absorbent cotton. If the solution is needed in a hurry, the resins may be digested with the alcohol at a gentle heat.

Varnish for Wood and Metal.—Preparation from the black resin from *Semecarpus Gardneri*, Thw., which see under "Materia Medica."

Acid-Proof Cement—Preparation.—Mr. H. Flemming states that a cement, which unites chlorine gas and vapors of acid, is prepared by mixing the residues of the distillation of glycerin (which are sold in the market in form of a thick liquid) with dry, sifted clay, to a plastic mass. About three parts of clay are required for one part of residue. Thus prepared, the cement is very resisting, and does not even lose its plastic properties, since the glycerin contained in it prevents its drying up at the temperature usually existing in the chlorine or acid apparatus.

This cement cannot be used where it will be exposed to atmospheric influences, since it will absorb moisture from the air.—New Rem., Jan. 1883, 25, from Dingler's Polyt. Jour.

Acid-Proof Cement.—One part of caoutchouc and two parts of linseed oil are melted together, and the mass thoroughly mixed with sufficient white bole until the proper consistence is obtained. This cement becomes somewhat softer by heat, is not attacked by hydrochloric or nitric acid, and does not readily harden; to facilitate the latter it may be mixed with one-fifth litharge or red lead.—Polyt. Notizbl.

Cement for Glass.—Dissolve finely cut caoutchouc, 1 part, in chloroform, 64 parts; add finely powdered mastic, 16 parts, and macerate until dissolved. The cement is applied with a brush. A larger proportion of caoutchouc renders the cement elastic.—Zeitschr. Œst. Apoth. Ver., 1882, p. 435; from Polyt. Notizbl., in Amer. Jour. Pharm., Feb. 1883, 103.

Cement for Aquaria, Stone, Wood, and Glass.—Bienert recommends the following: Melt together crude gutta percha and black pitch, of each 10 parts, and common turpentine, 1 part. The mass may be rolled into sticks, which, for use, are melted like sealing-wax. The proportion of turpentine is varied according to the hardness of the pitch.—Rundschau, 1882, p. 686; from Phar. Zeit. Russl., in Amer. Jour. Pharm., Feb. 1883, 103.

B. PREPARATIONS.

AQUÆ.

Medicated Water.—U. S. P., 1880. Expeditious preparation. Mr. E. V. Zoeller observes that the preparation of those waters in which the formulas direct the addition of essential oil, or, in case of camphor water, a solution of camphor, to cotton, and picking apart with the fingers until the liquid is evenly disseminated throughout, will be found to be a very slow and tedious process, especially if these waters are made in more than ordinary quantities. To perform this operation in a short space of time, and more effectually, he finds an excellent implement to be the common hand cotton or wool card, the implement that was used in combing cotton or wool preparatory for use upon the spinning-wheel. The implement is made of bent wire, usually iron card-teeth, inserted on leather, fastened upon wood, and is about four by ten inches square. Two or a pair of such are required. The method of using suggests itself upon sight, though some degree of dexterity is necessary, which is, however, quickly acquired by a little practice. The liquid is simply poured upon the cotton as instructed, and applied to the card, when, with a few minutes' combing or carding, the object is attained which would usually require some twenty or thirty minutes.—New Rem., May 1883, 158.

Distilled Waters.—Improvement of odor. See *essential oils* under "Organic Chemistry."

Chloroform Water.—Preparation and uses. According to Messrs. Laségue and Regnault, chloroform water is obtained by pouring into a bottle, three-quarters filled with distilled water, an excess of chloroform, agitating several times and allowing to settle, until the chloroform has entirely separated and the aqueous solution is perfectly transparent. This solution now contains 9 per cent. of chloroform.

Experiments have shown that the presence of the chloroform does not modify the solvent power of the water upon various salts, such as chlorate or bi-carbonate of potassium, or borate or salicylate of sodium.

Though it is easy to devise a formula for a syrup of chloroform, or to administer it in an alcoholic vehicle, the authors think that chloroform water is fully sufficient for internal administration. It has an agreeable taste, and leaves a refreshing taste in the mouth, which lasts for some minutes after it is introduced, without leaving a persistent after-taste, such as is the case with ethereal, etc., solutions. The authors consider it to be superior to anything else, as a basis or vehicle, or excipient for administering other medicines.

The property of maintaining its taste in the mouth for several minutes make, chloroform water a valuable vehicle for administering nauseous or bitter medicines. It may also, with advantage, be associated with castor oil, various emulsions, etc.

Besides serving as a vehicle for other medicines, however—and it may be used as such in almost all cases, since there appear to be but few instances (see below where its use would be injurious—it has a positive. therapeutic action upon the mucous membranes it comes in contact with In the stomach it undoubtedly has an excitant action. But it acts differently, according as it is introduced just before, or during, or after meals.

Given just before eating, chloroform water is apt to impair the appetite; but, after eating, if taken by itself or in some sweetened wine, it increases the stimulating effects of the latter. It is particularly valuable as an agent to counteract the many affections caused by a deranged digestion. Its maximum therapeutic effect is exhibited three or four hours after meals, at a time when the functional disturbances show themselves by yawning, intestinal tension, or gaseous eructations, or a sensation of pressure in the epigastrium, pain in the region of the heart, flushing of the face, or attacks of vertigo.

On the other hand, if the digestive troubles betray themselves by lancinating stomach pains, by anxiety, angina, a transient febrile sensation, dryness of the mouth, painful tympanites, palpitation, etc., the action of chloroform water is injurious. In fact, any excitant is contra-indicated at this stage.—New Rem., Feb. 1883, 56; from Rep. de Pharm., 1882, 421.

CATAPLASMATA.

Linseed Poultice—Preparation and Application.—F. P. Atkinson, M. D., says that the meal deprived of its oil is far better than that from which the oil has not been extracted. The latter does not retain its heat as long, and, unless covered by some fabric, is not so easily removed as the poultice made from the former. The exhausted meal takes up more water and retains its heat longer. In making a poultice, the meal should be thoroughly stirred with a spoon, while boiling water is gradually added, and when of proper (rather soft) consistence, should be spread on linen. The ability to bear the heat on the back of the hand is a good test of the degree to be used. The poultice should be applied directly to the skin, without intervening fabric, and covered on the outside with good oiled-silk. A teaspoonful of laudanum may be sprinkled on the surface to increase its anodyne effects, or in place of water may be used a boiling infusion of chamomile or poppy-heads. When the skin is inflamed, three grains of sulphate of zinc, or of alum may be added to each ounce of the water. A solution of one to forty of carbolic acid may be used instead of simple water in the case of sloughing-wounds. Three or four hours is a good rule to follow in changing poultices on the chest, the front and back being covered by separate poultices, and only one should be removed at a time. A fresh one should be ready when the change is made. Frequent changes are most grateful in cases of abdominal pain.—New Rem., Mar. 1883, 88.

Linseed Poultice—Preparation from Exhausted Linseed.—M. Lailler writes, in the "Répertoire de Pharmacie," that linseed meal which has been deprived of its oil is far superior to that which is freshly ground and used in its natural state, and quotes his own experience and the authority of Deschamps in proof of this statement. The latter says, "The oil of the grain is so imprisoned by mucilaginous matter when warm water is added to the linseed meal that no one has ever observed any trace of the oil; neither the linen nor the part poulticed is ever greased." When the oil is present, it quickly becomes rancid, and seriously affects the skin. M. Lailler finds that the meal deprived of its oil makes a lighter poultice, which retains its heat longer and is less liable to cause unpleasant results than one made of the oily meal.—New Rem., Jan. 1883, 18, from Chem. and Drug.

Mustard Cataplasm—Addition of Molasses.—According to Dr. Tyson, of Philadelphia, the addition of molasses to mustard in making a sinapism furnishes a mild, persistent counter-irritant, which can be worn for hours. The editor of "New Remedies," however, cautions against the implicit acceptance of the above statement.—New Rem., April 1883, 100.

Kern's Cataplasm—Composition.—This local remedy, recommended by Prof. Busch for producing the resorption of buboes and of malignant lympho-sarcomas of the neck, is made by mixing one part of powdered black mustard with four or five parts of soap. It is inclosed in thin gauze, and applied over the tumor, where it is allowed to remain from four to twelve hours. The skin becomes erysipelatous, and is dressed, after the removal of the poultice, with vaseline and cotton. Following the application, the tumor softens and disappears. Prof. Busch offers no explanation of the remarkable action of this remedy.—New Rem., Feb. 1883, 50, from Med. Record.

CERATA ET UNGUENTA.

Ointments.—Comparative value of *Benzoin* and *Styrax* in their preservation, which see, under "Materia Medica."

Glycerin-Salves.—Non-absorbent character. Vigier maintains that the addition of glycerin to ointments or its employment as a vehicle for external remedies, prevents the absorption of the latter by the skin. Repeated embrocations of 10 grams of iodide of potassium dissolved in 30 grams of glycerin are said never to have been followed by the appearance of iodine in the urine. As soon as fat was used in place of glycerin, iodide made its appearance. Strong solutions of morphine and atropine also remained inert.—New Rem., June 1883, 188, from Gaz. Hebdom., through Pharm. Zeit.

Nitrate of Mercury Ointment.—Modified process. Mr. F. M. Tilton recommends the following process for making this ointment. He is of the opinion that the use of camphor has some effect which is of benefit to the preparation, and that probably it prevents the reduction of the mercuric compound.

Take of Mercury	ʒ iss.
Nitric acid	ʒ ij.
Lard	℥ ss.
Neat's foot oil	ʒ xijss.
Powdered camphor	ʒ ss.

Melt the fat together at a temperature not exceeding 170° F., dissolve the camphor in the hot fats, add the mercury, previously dissolved in the nitric acid, and stir the mixture while cooling.—Amer. Jour. Phar., Mar. 1883, 145.

Referring to the above, Mr. H. C. C. Maisch states that he has prepared some ointment by the above formula, and found it, notwithstanding it was stirred with a horn spatula while cooling, to darken considerably within two days. Stirred with an iron spatula it became rapidly dark colored.—Amer. Jour. Phar. May 1883, 232.

Unguentum Hydrargyri Nitratis. B. P.—Preparation.—Mr. Thomas Maben has studied the effects of acid solution of mercuric nitrate on olive oil at different temperatures, and the effect of different temperatures in the preparation of Ungt. Hydr. Nitrat., B. P. Presuming the ingredients required for the process to be pure, he regards the B. P. process to be all that is desired, provided that the word "hot" be interpreted to mean at least the boiling point of water. In his experience, based upon the experiments named, the temperature should not be less than 212° F., and might with advantage be even more, so that there may be uniformity not only in the appearance of the ointment, but also in its composition. —Phar. Jour. Trans., April 21; 1883, 857–858.

Unguentum Naphtholi—Preparation.—As used by Prof. Hardy, this ointment is made of 1 part of naphthol (which see under "Organic Chemistry") and 10 parts of petrolatum. The naphthol is dissolved in its own weight of ether, one-third of the petrolatum is added, and the mixture heated in a water-bath to expel the ether, when the semi-liquid mass is mixed with the remaining petrolatum.—Amer. Jour. Phar., May 1883, 271, from Jour. Phar. Chim., 1883, Feb. p. 143.

Unguentum Naphtholi.—Prof. Kaposi uses in skin diseases an ointment composed of naphthol, 15; prepared chalk, 10; soft soap, 50, and lard, 100 grams.—Amer. Jour. Phar., Dec. 1882, 629, from Wien. Med. Wochenschr.

Cold Cream.—Prevention of Rancidity.—It is stated in Amer. Jour. Phar. (Feb. 1883, 86), that the addition of salicylic acid to cold cream has been found an excellent preventive against the tendency to become rancid, while usefulness is enhanced by its healing qualities.

Pomade for Comedones.—The St. Louis "Medical Journal" says that Una, in "Virchow's Archives," recommended the following for comedones: Kaolin, four parts; glycerin, three parts; acetic acid, two parts; with or without the addition of a small quantity of some ethereal oil. With this pomade he covers the parts affected in the evening, and if need be, during the day. The comedones can be easily expressed after several days, most of them coming out by washing the parts with pumice-stone soap.—Amer. Jour. Phar., Dec. 1882, 629, from Chic. Med. Review, Oct. 15.

EMPLASTRA.

Blisters—New Method of Preparation.—Mr. Limousin has devised a new form of blisters, with a view to afford to the physician a greater variety of choice in degree and kind of vesication, and also to preserve the ready-made blister in better condition than is usual. A thin layer of ordinary blistering cerate is spread upon strong, thin, unsized paper, and covered with the same. The vesicating layer is about one and a half millimeter in thickness, and one of its surfaces is camphorated. When using the blister, its outline is marked on the paper covering it; it is then cut and applied to the part by means of adhesive plaster. If desired the paper may be removed from either side by means of a wet sponge, or it may be oiled.—New Rem., Aug. 1882, 234, from Rép. de Pharm.

Emplastrum Ichthyocollæ Impermeabile—Preparation.—Eugene Dietrich has examined a Russian water-proof courtplaster, and gives the follow, ing directions for its preparation: Rub the requisite quantity of castor oil necessary for making flexible collodion with a little zinc-white, add the collodion, and dip glass plates into the mixture, repeating this twice or three times until the film of collodion is of the desired thickness; then spread upon it a concentrated solution of isinglass, and when dry, remove from the glass plate.—Amer. Jour. Phar., Feb. 1883, 99, from Rundschau, 1882, p. 662.

ESCHAROTICA.

Moxa—New Formula.—Under the name of *crayon feu*, Dr. Moses describes a preparation made as follows: Charcoal powder 30 grams, potassium nitrate 4 grams, powdered iron 5 grams, benzoin 1 gram; the whole to be made up with some active substance into forty crayons. He so obtains a hard preparation, which is easily inflamed by a match, and which he proposes for the cauterization of poisoned wounds and when the actual cautery is required.—Amer. Jour. Phar., Feb. 1883, 82, from Medical News, 1883, p. 40. Gaz. Hebdomadaire, Dec. 1, 1882.

Caustic Pencils of Sulphate of Zinc—Preparation.—These are best prepared, according to G. Vulpius, by melting in a small porcelain capsule, the crystallized salt in its water of crystallization, and pouring the fused mass rapidly into conical moulds made of waxed paper. Ordinary paper is unsuitable for this purpose, since it becomes firmly attached to the pencil.—Amer. Jour. Phar., May 1883, 273, from Phar. Zeitung, 1883, W. 17.

Pencils of Chloride of Zinc—New Process.—These are made so as to contain either one part or two parts of wheat flour to one part of the chloride. C. Schmidt recommends triturating the zinc chloride in a warm mortar to a fine powder, when it will have a moist appearance; the wheat flour, previously well dried, is then rapidly incorporated by kneading, without the addition of water; the mass is rolled out upon paper into thin cylinders, these are well dried in a drying oven, and by dipping into melted white wax are thinly coated, and may thus be preserved.—Amer. Jour. Pharm., June 1883, 309, Phar. Zeitung, No. 31, 1883.

EXTRACTA.

Extracts of Aloes of the Br. Phar—Formation of Inert Resin during Evaporation.—Mr. Robert Aitken, having his attention drawn to the variable action of extract of aloes as dispensed in different towns, was led to make some experiments, which have shown that commercial samples of extract of aloes, both from Socotrine and Barbadoes aloes, contained resin in quantities from a trace to 25 and even 30 per cent. Further experiments have led the author to the conclusion that the quantity of resin is in proportion to the care taken in the preparation of the extract, the larger quantities being due to the greater and more prolonged exposure to heat. A sample made by evaporating in a current of warm air, was found to be perfectly free from resin, whilst another, made by evaporating upon a water-bath, contained considerable quantities of the resin. Both methods being admissible by the B. P., the author recommends that only the method of evaporation in a current of warm air should be employed and recognized. Phar. Jour. Trans., Dec. 23, 1882, 501.

Extract of Malt—Qualities of a Good Preparation.—Professor Albert B. Prescott discusses the value of malt extracts, both as food and as medicine. Whilst unmalted grains yield only three or four per cent. of their weight to solution of water, when malted they yield from one-half to two-thirds of their weight, including nearly half of their albuminoids, and the whole of these soluble materials may be obtained in preservation as extract of malt. Soluble albuminoids being more easily appropriated than their insoluble forms, it is important that these should be contained in the extract in an unchanged condition. Dextrin and malt sugar may also be injured by over-heating, even at the temperature of the water-bath. Whilst there may be a difference of opinion as to the value of unchanged diastase in the malt extract, its presence in an unchanged condition should be insisted on as a guarantee of the careful preparation of the extract of malt.—Pharmacist, Febr. 1883, 53–55.

Extract of Malt.—Determination of Value.—I. F. Carl Jungk, in an exhaustive paper, communicates a method for the examination of extract of malt, which is based upon the following, in his opinion, essential properties:

I. The extract should be light in color; dark-colored preparations are partly burned, therefore contain neither active diastase nor soluble albumen, and differ from ordinary molasses only in containing dextrin.

II. The free acid should not be present over a certain proportion.

III. The proportion of water and solid matters should be within certain limits.

IV. The principal determination is that of the diastastic strength. A good extract should contain all soluble substances of the malt, of which diastase is the principal one. If the extract contains no diastase, it differs little from honey or any other saccharine preparation. The action of diastase on amylaceous substances is wanted, if the extract is to possess any value for a sick stomach at all.

Liebig uses powdered malt in preparing his infants' food, in order to change the starchy matter before it enters the stomach into easily digestible compounds. If we consider how much amylaceous food we use which could be changed by a small quantity of diastatic extract of malt into dextrin and sugar, the value of such a preparation in the process of digestion is readily seen. Although the saliva possesses the same properties as the diastase of the malt, the action of the latter is nearly five times as great as that of the former, and the diastastic action of the malt can stand about four times more acid than that of the saliva without being interfered with.

V. Nitrogenized constituents (albuminates) should be present in an easily digestible form.

The method of determination is too voluminous to find place here.—Am. Jour. Pharm., June 1883, 289–298.

Extract of Licorice.—Testing. The following method for the examination of commercial extracts of licorice is suggested by C. Lewis Diehl.

I. Expose 1.0 gram of the mass to a gentle heat until it experiences no further loss in weight. Calculate this loss as moisture.

II. Digest 10.0 grams of the mass contained in a flask with 100.0 grams of distilled water until it is fully disintegrated ; when cold, cautiously pour on 200.0 grams of alcohol, and vigorously shake the flask. By this procedure, the precipitate produced will be prevented from adhering to the sides of the vessel. Allow it to stand for several hours, shaking occasionally, then pour on a double thick filter of sufficient slze, and wash the remaining dregs with a mixture of two parts of alcohol and one part of water until the filtrate begins to pass colorless.

III. After the foregoing residue has become air-dry, exhaust the same with distilled water, so that the filtrate may pass colorless; reduce the latter to a small volume and then transfer to a small tared porcelain capsule, being careful to remove any residue from the larger evaporating dish by means of a little warm distilled water, adding the rinsing to the contents of the small capsules. Evaporate to dryness by means of a gentle heat, and calculate the residue as gummy matter.

IV. Carefully dry the dregs remaining on the filter under III., employ the outer filter as counterbalance, and calculate as insoluble substance.

V. Carefully concentrate the alcoholic filtrate obtained under II. to the consistence of syrup, and re-dissolve in distilled water. Then, to the clear solution, add dilute sulphuric acid gradually until a precipitate (glycyrrhizin) ceases to be produced: Wash the glycyrrhizin with cold water, allow to dry at the ordinary temperature, and dissolve in strong alcohol, whereby about fifteen per cent. of insoluble tasteless residue will remain, which, however, is soluble in ammonia. Now filter the alcoholic solution of glycyrrhizin, wash the filter with alcohol, evaporate the combined filtrates to dryness, then redissolve the residue in a small quantity of ammonia, again evaporate to dryness in a tared capsule, and estimate as ammoniated glycyrrhizin.—Pharm. Rundschau, Feb. 1883.

Ergotin—Improved Process of Preparation.—Mr. C. S. Hallberg recommends the preparation of ergotin from purified powdered ergot (see *Ergot* under "Materia Medica") as follows: The purified ergot is exhausted with water as in the preparation of fluid ergot, and the liquid evaporated to one-half the volume of the ergot used, alcohol is added to twenty-five per cent., after standing filtered, and the filter washed with twenty-five per cent. alcohol. The alcohol is recovered and the aqueous solution evaporated to pilular consistence. The yield is about fifteen per cent. of the drug used. This ergotin will be found to keep well; it is not very hygroscopic, and one grain represents about six grains of ergot. It can be mixed with sugar-of-milk in various proportions, when of hard consistence, and the desiccation completed until it is sufficiently brittle to be triturated to a fine powder.

Saccharated Extract of Ergot is obtained by adding sufficient milk sugar to restore the original weight of the drug.—Amer. Jour. Phar., Jan. 1883, 13–14.

Ergotin—Preparation in form of solution for hypodermic use, which see under "Liquores."

Ergotin—New Preparation.—According to Conrad, a definite quantity of carefully purified ergotin is to be mixed with melted gelatin and cast into small cylinders. The quantity of ergotin contained in each is about 0.2 gm. (3 grains). These cylinders are kept in a small test-tube in the pocket case, and when wanted for use, one of them is dissolved in a quantity of water corresponding to the desired volume, by means of a gentle heat, for which the flame of a match is sufficient. The solution is injected at the temperature of the body. In the large number of cases in which it has been used, it has never produced any abscesses, and has always had prompt effect.—New Rem., June 1883, 171, from Wien. Med. Blätt.

Extract of Male Fern—Poisonous Dose.—A fatal dose of extract of male fern is reported in the "Ceylon Observer." One and one-half ounces was administered in two doses, along with 3 drachms of powdered kamala. The patient being distressed after the first dose, made inquiry and was advised to take the second, whereupon vomiting and purging, with expulsion of the tape-worm, set in, but the patient died in a few hours.—Amer. Jour. Phar, Feb. 1883, 97, from Phar.; Jour. Tran., Oct. 14, 1882, 312.

Extract of Convallaria Majalis.—Proper method of preparation, for which see *Convallaria Majalis* under "Materia Medica."

Extract of Guachamaca.—A new South American remedy. See *Guachamaca* (*Apocynocese*) under "Materia Medica."

Extract of Plantain.—Preparation from the leaves of *Plantago lanceolata,* which see under "Materia Medica."

Extract of Meat—Composition of a New Brand.—The new brand of extract of meat, made by E. Kemmerich & Co., of Santa Elena, Argentine Republic, has been analyzed by G. E. Lichtenberger, and been found to contain:

		(Fray-Bentos.)
Water	16.53	22.26
Organic matter	62.65	57.51
Salts (ash)	20.82	20.23
	100.00	100.00

Among the constituents are:

Nitrogen	9.25	7.42
Phosphoric acid,		
in the ash	33.12	30.46
in the extract	6.89	6.16
Potash,		
in the ash	44.83	40.82
in the extract	9.25	8.27

The second column contains the figures obtained from a sample of the extract made by the original Fray-Bentos Company, analyzed at the same time. We do not, however, attribute much value to the figures obtained for the latter, since we know that the composition slightly varies, and that samples have been in the market containing much less water, and, therefore, more of the various solid constituents.—New Rem., February 1883, 56.

EXTRACTA FLUIDA.

Fluid Extracts—Formulas of the Pharmacopœia of 1880.—Mr. Alonzo Robbins reviews the formulas for fluid extracts of the New Pharmacopœia, in Amer. Jour. Phar., Feb., Mar., April and May, 1883. Mr. Robbins' paper will be read with interest and profit, but is not suited for abstraction. In the May number, several formulas recommended by the Philadelphia College, but not admitted into the Pharmacopœia, are discussed.

Liquid Extract of Cinchona—Inefficiency of the B. P. Process.—Dr. B. H. Paul, having observed a great deficiency in alkaloid in commercial samples of liquid extract of cinchona, was induced to make some experiments with cinchona barks of known alkaloidal strength. Following the process of B. P., he obtained from Calisaya bark, assaying 148.25 grains of alkaloids to the pound, a liquid extract containing only 8.6 grains to the fluid ounce, whilst from Indian bark, assaying 397 grains to the pound, he obtained a liquid extract containing only 14.32 grains. In the first case, the liquid extract should have contained 37 grains of alkaloid per fluid ounce, whilst in the case of the Indian bark, 99.25 grains of alkaloid per fluid ounce would have been present if the latter had been completely extracted and retained in solution. The cause of deficiency was found to be both in the failure of the process to extract the bark completely, and in the formation of a precipitate during the process of evaporation, the author giving the following tabular statement of the results of his experiments in this direction made with the Indian bark:

	Quinine.	*Cinchonine.*	*Cinchonidine.*	*Amorphous.*
Present in 1 fluid ounce liquid extract	4.39	3.50	2.62	3.81
Present in deposit	1.32	1.68	0.91	0.27
Residual bark contained	28.04	28.32	17.47	6.92
Total in 4 ounces bark	33.75	33.50	21.00	11.00

Experiments made with the infusion and decoction of cinchona, B. P., have furthermore shown that these are, pharmaceutically, better preparations than the liquid extract of the B. P., which contains only one-seventh of the total alkaloid originally in the bark, and, as usually met with, contains only a very small proportion of quinine or other alkaloid.—Phar. Jour. Trans., Mar. 10, 1883, 737-739.

Fluid Extract of Wild Cherry Bark.—Improved Process.—Mr. Clay W. Holmes recommends a process for the preparation of this fluid extract which, he states, gives a very satisfactory preparation. It is a process of repercolation, the powdered bark being divided into five equal portions, and percolated successively with the percolates from the previous portion. —See Drug. Circ., Aug. 1882, 115.

Fluid Ergot.—Preparation.—Mr. C. S. Hallberg recommends a preparation under the name of "Fluid Ergot," as preferable to the fluid extract. It is prepared from "powdered purified ergot" (see *Ergot* under "Materia Medica") as follows: The purified ergot is digested with twice its weight of water at 150° F. for twenty-four hours, and expressed; the residue is again macerated in warm water for twelve hours. After settling, the expressed liquids are strained and evaporated separately, when both together measure one-half as much as the ergot employed; they are mixed and sufficient alcohol added to make the liquid of 25 per cent. alcoholic strength, or one-third as much as the aqueous solution.

After standing, the liquid is filtered and the gummy residue washed with so much 25 per cent. alcohol as to make the filtered liquid measure three-fourths, or 75 per cent., of the amount of crude drug employed (volume for weight). To this glycerin is added to make the finished preparation represent the amount of crude ergot originally used, pint for pound. As will be seen, this preparation contains 18 per cent. alcohol, rendering it unobjectionable for hypodermic use. Fluid ergot is an opalescent, amber-colored liquid, possessing a peculiar musty odor. It remains pretty clear unless exposed for a long time to the light or atmosphere. It should, therefore, be kept in small, well-filled bottles, in a cool, dark place.—Amer. Jour. Phar., Jan. 1883, 11. See also under "Liquores."

Ammoniated Extract of Ergot—Preparation.—Mr. A. W. Gerrard states that a preparation bearing the above name has been known to him for at least ten years. He records some experiments made with a view to establishing a process for its preparation, and as a result recommends the following:

Take 10 parts of crushed ergot, macerate it for eight or ten hours with frequent stirring in fifty parts of cold water, containing ½ per cent. of strong solution of ammonia; then throw it upon a flannel strainer, and allow it to filter. Wash the ergot from time to time with more ammoniacal water till sufficiently exhausted. The filtrate, which is somewhat turbid, is evaporated to 5 parts, any scum or fat rising to the surface being carefully removed. The extract when cool is treated with an equal volume of aromatic spirit of ammonia, and the product set aside until subsidence is complete; the clear portion is then decanted and the residue filtered through felt or flannel, washing the deposit with a little more spirit, so as to bring the volume to 10, 1 part of fluid thus containing the soluble matter of 1 part solid of ergot. In appearance this extract is much darker than the ordinary liquid extract, the dose being the same. Its average sp. gr. is 1000, its odor mainly ammoniacal, and it has kept well for nearly a year, no apparent change having occurred.—Year Book of Pharm., 1882, 460–463.

LINIMENTS.

Liniments—Preparation with Cotton Seed Oil.—Mr. S. S. Bradford has substituted cotton seed oil for olive oil in a number of liniments, with the following results:

Linimentum Ammoniæ.—This liniment, made with cotton seed oil, is of much better consistency than when made with olive oil. It is not so thick, will pour easily out of the bottle, and if the ammonia used is of proper strength, will make a perfect liniment.

Linimentum Calcis.—Cotton seed oil is not at all adapted to making this liniment. It does not readily saponify, separates quickly, and it is almost impossible to unite when separated.

Linimentum Camphoræ.—Cotton seed oil is far superior to olive oil in making this liniment, it being a much better solvent of camphor. It has not that disagreeable odor so commonly found in the liniment.

Linimentum Chloroformi.—Cotton seed oil being very soluble in chloroform, the liniment made with it leaves nothing to be desired.

Linimentum Plumbi Subacetatis.—When liq. plumbi subacet. is mixed with cotton seed oil and allowed to stand for some time, the oil assumes a reddish color similar to that of freshly-made tincture of myrrh. When the liquor is mixed with olive oil, if the oil be pure, no such change takes place. This leads the author to suggest a simple and easy way to detect cotton seed oil (which see under "Organic Chemistry") when mixed with olive oil.—Am. Jour. Phar., Oct., 1882, 481–482.

Carbolic Acid Liniment, prepared by dissolving carbolic acid 1 part in olive oil 100 parts, is recommended for the cure of itch, for which purpose two applications are said to be sufficient.—Amer. Jour. Phar., Sept. 1882, 465, from Zeits. f. Diagn., i, p. 80.

Itch Liniment—Formula.—A liniment which has been successfully employed in Rostock for years, according to Dr. Brunnengraeber, consists of purified storax 40, olive oil 5, and alcohol 5.—Amer. Jour. Phar., Mar. 1883, 142, from Phar. Handelsbl., 1883, No. 1.

Linimentum Naphtholi, used by Prof. Kaposi in eczema crustosum of the scalp, is made by mixing one part of naphthol with 100 parts of a fat oil like almond, olive, or cod-liver oil.—Amer. Jour. Phar., Dec. 1882, 629, from Wien. Med. Wochenschr.

Thompson's Chloroform Liniment—Formula.—This liniment, according to Dr. G. A. Parsons, is composed of chloroform, alcohol, ammonia water, spirit of camphor, tincture of aconite root, of each 2 ounces, spirit of nitrous ether 6 ounces.—Amer. Jour. Phar., Mar. 1883, 152, Med. Brief, 1882, p. 508.

Camphorated Sulphur Lotion—Formula.—Pierre Vigier recommends the following modification of the *lotion au soufre et au camphre:* Rose-water 250, camphor 30, precipitated sulphur 20, powdered gum arabic 8 parts. This remains a homogeneous mixture for a considerable length of time, and, when in the course of time the insoluble constituents have separated, may again be made uniform by gentle agitation. Am. Jour. Phar., May 1883, 255, from N. Y. Med. Jour., Jan. 20, 1883.—Gaz. Hebdom. Med. et Chir.

Stillingia Liniment—Formula.—Oil of stillingia ℥j, oil of cajuput ℥ss, oil of lobelia ʒij, alcohol ℥ij; mix. Used as a local application in croup, and as a cough medicine, in doses of one drop on a lump of sugar.—Amer. Jour. Phar., Mar. 1883, 142, from Eclectic Med. Jour., 1883, p. 45.

LIQUORES.

Liquor Sodæ Chloratæ, B. P.—Constitution.—The liquor sodæ chloratæ of the Br. Phar., which is made by passing chlorine gas into a solution of sodium carbonate, is usually stated to contain sodium hypochlorite and chloride, with sodium bicarbonate. Observations made by Williamson (Mem. Chem. Soc., II., 234), as well as by themselves, led Messrs. Wyndham R. Dunstan and F. Ransom to the conclusion that liquor sodæ chloratæ, B. P., contained no sodium hypochlorite, but hypochlorous acid in the free state; and this conclusion is now fully supported by a series of experiments described by the authors in Phar. Jour. Trans. (Feb. 1883, 667–668). On the other hand, samples of commercial liquor sodæ chloratæ, obtained from four of the principal wholesale houses in London, contained no free hypochlorous acid, but were alkaline to test paper, and contained sodium hypochlorite. Hence, it is evident that they had been obtained by the decomposition of bleaching powder with sodium carbonate.

Liquor of Iodide of Iron—Examination of a Commercial Sample.—Mr. B. S. Proctor has examined a sample of solution of iodide of iron, recommended by the maker on account of its permanence and for the purpose of making the officinal syrup. He found the preparation to be acid, containing some free phosphoric acid. Oxalic acid, as ferrous oxalate, was also determined to be present. He also determined the preparation to contain 13.47 grains of iodide of iron in a half fluid drachm, whereas it should have contained 17.2 grains to produce full strength syrup when the liquor was used according to the directions accompanying it.—Yearbook of Pharm., 1882, 508–510.

Solution of Ergotin—Preparation for Hypodermic Use.—Dannecy prepares this as follows: Bruised ergot is freed from oil by carbon bisulphide and afterwards displaced with cold distilled water; the liquid is evaporated to about one-third its volume, when cool filtered from the albuminous matters and treated for 24 hours with well-washed animal charcoal at a temperature of from 25 to 30° C., when it is cooled, filtered, the charcoal washed with distilled water and the decolorized filtrate evaporated over the water bath until for every 100 parts of ergot used, 90 parts of liquid remain; 10 parts of cherry laurel water are then added, and after cooling, the liquid is filtered.

This solution is of an amber color, has a strong acid reaction upon litmus paper, has been found to be quite active and innocuous, and keeps unaltered for a long time. By further concentration in the water bath it may be obtained of double or triple the strength recommended above.—Amer. Jour. Phar., May 1883, 272, from Bull. Gén. de Thér., 1883, March 15, p. 214.

Essence of Rennet—Preparation from Fresh Stomachs.—Dr. J. Nessler communicates the result of some experiments made with the object of comparing the activity of essence of rennet made from dried stomachs and that of essence made from fresh stomachs. The experiments showed that using corresponding quantities of dried and fresh stomachs, the latter yielded the more active preparation. It was found, moreover, that the activity of the preparation from a fresh stomach could be increased by the removal of mucus, which is effected without injury by means of blotting paper. The author gives the following instructions: Chop up a fresh calf's stomach as finely as possible, pour upon it two litres of water in which 100 grams of common salt has been dissolved, and shake well. After twelve hours add 200 cc. of 90° alcohol, and allow the whole to stand, with frequent stirrings, in a closed flask for three weeks, then decant, and add sufficient blotting paper to cover it. After several weeks, during which the vessel must be kept well closed, the essence of rennet is drawn off into bottles and preserved. Such a liquor is capable of curdling 6000 times its volume of milk; and, when kept in well corked bottles, it was found, after two years, to curdle 5451 times its volume—Phar. Jour. Trans., Aug. 19, 1882, 150, from Phar. Ztg., July 15, 1882.

Solution of Terbromide of Arsenic—Preparation.—Mr. Robert F. Fairthorn communicates his method for preparing *Terbromide of Arsenic* (which see under "Inorganic Chemistry"), and gives the following formula for making the solution:

Terbromide of arsenic	100 grains.
Distilled water	10 fluidounces.

Mix and dissolve.

This forms a canary-colored liquid having an odor that recalls that of chloral. The dose which has usually been given has been two drops, containing the twenty-fourth of a grain of the arsenical salt, repeated every four hours.—Amer. Jour. Phar., Mar. 1883, 143.

Solution of Bromide of Arsenic.—Dr. Clemens' formula. The following solution, intended as a substitute for Fowler's solution, was first suggested by Dr. Clemens, of Frankfurt-am-Main:

Arsenious acid	1 part.
Carbonate of potash	1 part.
Bromide	1 parts.
Distilled water, to make	93 parts.

Boil the carbonate and the acid with most of the water, until dissolved; when cold add the bromine and water enough to make the prescribed quantity. It is said to improve by age, owing to the combination of the bromine. The dose is one to four drops in water, once or twice daily.—New Rem., Mar. 1883, 85.

Solution of Morphine in Oil is proposed by Larochette to be prepared by dissolving 5 parts of the crystallized alkaloid in 1,000 parts of expressed oil of almond. Since dehydrated morphine is soluble in 125 parts of the hot oil, such a concentrated solution may be kept on hand and properly diluted when wanted for medicinal use.—Amer. Jour. Phar., Aug. 1882, 394, from Jour. Phar. Als.-Lorr., 1882, p. 105; Bull. Phar. Lyon.

Fehling's Solution.—Use of a modification for determining Arsenious acid in the presence of *Arsenic acid*, which see under "Inorganic Chemistry."

Solution of Tannin—Deodorization.—See *Tannic Acid* under "Organic Chemistry."

MISTURÆ.

Emulsion of Cod-Liver Oil with Phosphate of Calcium—New Formula.—According to Evan B. Merriam, this preparation will retain the insoluble phosphate of calcium in suspension for a long time when made by the following process:

Take of well-washed phosphate of calcium, dry and in fine powder	grs. clx.
Pure muriatic acid, a sufficient quantity, about	fʒ v.
Water of ammonia, a sufficient quantity, about	fʒ iiss.
Best cod-liver oil	f℥ viij.
Pure glycerin	f℥ j.
Gum arabic, in powder	℥ j.
Oil of nutmeg	♏v.
Oil of lemon	♏x.
Oil of gaultheria	♏v.
Water, sufficient to make	f℥ xvj.

Dissolve the phosphate of calcium in the muriatic acid, dilute the solution with ten times its volume of water, and add the water of ammonia, also diluted with water, until it ceases to produce a white precipitate. Throw the whole on a filter, and wash as long as the washings render a solution of nitrate of silver turbid. To this precipitate, contained in a capsule, add the glycerin, and apply a gentle heat, until the mass is well diffused and the mixture becomes nearly clear; then remove, and mix it with the mucilage, and make the emulsion in the usual way.—Amer. Jour. Phar., Aug. 1882, 388.

Pancreatic Emulsion of Cod-Liver Oil—Test.—M. J. Creuse determines the percentage of oil in emulsion by repeated agitation with ether, and evaporation of the ether solution to constant weight. The oil so obtained from a *true* pancreatic emulsion has the appearance of ordinary cod-liver oil, but it differs in that on shaking it with water it again forms a perfect emulsion. It appears, therefore, that the pancreatizing effect on oils is complete and permanent. A sample, accidentally heated to 212°, was perfectly emulsionized on shaking with water.—Drug. Cir., July 1882, 97.

Deodorized Cod-Liver Oil and Iron—Preparation.—Mr. W. A. Henry recommends the following: Take of cod-liver oil, 1 pint; dried sulphate of iron, 64 grains; powdered castile soap, 128 grains; powdered charcoal, 1 ounce; ground coffee, ½ ounce (or powdered chocolate, ¼ oz.); hot water, q. s. Dissolve the sulphate of iron and castile soap, each separately in a sufficient quantity of hot water, mix the two solutions, and after washing the resulting precipitate (oleate of iron) with water, triturate it in a mortar with the cod-liver oil (previously heated in a water-bath) gradually added; then add the remaining ingredients, subject the whole to a water-bath for an hour, and filter, while hot, through paper or flannel. The preparation is dark brown, almost transparent, and has only a faint odor. It is acceptable to persons who would reject the oil in its ordinary form.—New Rem., Dec. 1882, 361.

Mucilage of Gum Arabic—Admixture with Tincture of Chloride of Iron.—Mr. Louis Genois has made some interesting experiments on mixtures of mucilage of gum arabic and tincture of chloride of iron. When these are mixed in the proportion of 2 parts of mucilage to 1 part of tincture coagulatation ensues; but if the proportions are reversed a clear mixture results. The coagulation formed, probably a compound of gum and ferric chloride, appears to become soluble on the addition of an acid. Thus a mixture of 6 fluid drachms of mucilage, 2 fluid drachms each of tincture of chloride of iron and dilute phosphoric acid, and water sufficient to make half a pint, may be mixed in any manner desired, the result being a clear liquid.—Drug. Circ., July 1882, 97.

A New Purgative Mixture.—Chloral hydrate as a purgative has been recommended by Dr. Bonatti, in combination with senna, as follows:

Infus. sennæ	(*e* 6·0 — 12·0 gm.)	300·0 gm.
Chlorali hydrat		1·5 — 3·0 gm.
Syrupi		30·0 gm.

Drastic effects have been obtained with this mixture after failure with jalap and croton oil.—Amer. Jour. Phar., June 1883, 309, from Schweiz. Woch. Phar., 1883, p. 102, D. Med. Zeitung.

Lemonade Iron—Formula.—This preparation, as prescribed by Professor Goodell, of the University of Pennsylvania, consists of tinct. ferri chlor. ʒij; acid. phosphor. dil. ʒvj; spirit. lemon. ʒij; syrupi ad ℥vj. M. S. a dessertspoonful in water after meals.—Amer. Jour. Phar., Mar. 1883, 152, from Practitioner.

PILULÆ.

Pill-Making.—Mr. M. J. Averbeck makes some very interesting remarks on pill-making in pharmacies, in which the conditions that are necessary to form a satisfactory pill are thoroughly discussed. He finds one of the most convenient excipients to be a jelly of tragacanth,* composed of 1 part of tragacanth, 2 parts glycerine, and 2 parts of water. A smaller quantity of this is required than of the officinal excipient—confection of roses, syrup, mucilage of tragacanth, etc.—and it is particularly adapted to heavy powders, such as calomel, subnitrate of bismuth, etc. As a pill-coating, the author prefers talc†, and gives directions for this process.—New Rem., April 1883, 103–104.

Quinine Pills.—Method of examination for *Quinine*, which see under "Organic Chemistry."

Compound Cathartic Pills—Slight Change in Formula.—Dr. J. Dabney Palmer recommends the following formula, whereby this pill is rendered less drastic and more cholagogue in its actions. He states that it has been thoroughly tested in his part of the country (Monticello, Fla.), and is found superior to the U. S formula in every particular. The proposed formula is as follows: Comp. extr. colocynth, calomel, āā gr. 1½; ext. jalap, gr. 1; gamboge, gr. $\frac{1}{5}$. M.—Am. Jour. Phar., Nov. 1882, 577.

Blaud's Pills—Formulas.—The "Pharmaceutische Zeitung," 1882, p. 564, publishes various directions for preparing these pills, as follows:

1. Exsiccated ferrous sulphate 10.12, potassium carbonate 15.0, milk-sugar 6.0, syrup 7.5 gms. make 100 pills. A metallic lustre exceeding in elegance the coating with gold or silver may be given to the pills by rolling them upon a hard board in coarsely powdered graphites, dampened with a few drops of alcohol.—*M. V. Valta.*

2. Potassium carbonate, ferrous sulphate āā 15.0, powdered althea 1.5, tragacanth 1.0, glycerin ointment (composed of glycerin and tragacanth) 1.0 to 1.5 gm. A greenish, plastic mass is the result, from which pills are obtained which harden in ten or fifteen minutes, and are not deliquescent.—*E. Rudeck.*

3. The water of crystallization contained in the ferrous sulphate is to be replaced by powdered althea, the mass formed with a mixture of equal parts of mucilage and glycerin, and the pills dried in a drying closet.

4. Potassium carbonate 15.0, exsiccated ferrous sulphate 7.5, powdered althea 7.5, powdered tragacanth .3, glycerin sufficient; make 100 pills.—*O. Spoerl.*

5. Like 3, except that the mass is formed with honey.—Amer. Jour. Phar., Mar. 1883, 141.

Phosphorus Pills—Preparation.—Mr. H. H. Millhouse has made phosphorus pills by numerous methods, and draws particular attention to the following two as giving the most satisfactory bases for the administration of phosphorus. The first is as follows:

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* This was originally recommended by Mr. G. Welborn. See Proceedings, 1878, 128.

† Talc, or French chalk, was recommended by Mr. J. A. Cope, for this purpose, in 1874 (See Proceedings, 1875, 82), and again by Mr. C. Symes (See Proceedings, 1878, 126), who claims to have used it since 1860.

Phosphorus	5 grains.
Benzoated lard	250 "
Phosphate of calcium	205 "
Carbonate of calcium	20 "

Melt the lard by means of a water-bath, transfer to a strong-stoppered and perfectly dry glass bottle made warm; add the phosphorus; shake until dissolved; then pour the solution upon the powders, previously well mixed and kept in a similar stoppered bottle, kept warm by standing in hot water, shaking briskly until the mass is thoroughly uniform in consistence.

The second method is as follows:

Phosphorus	4 grains.
Powdered mastich	30 "
Paraffin wax	50 "
Vaseline	66 "
Kaolin	90 "

Melt the wax and vaseline together in a porcelain capsule by the heat of a water-bath; place them in a strong glass-stoppered bottle, previously warmed by allowing it to stand in an oven or other warm place; add the phosphorus (care being taken that the mixture is not too hot, a temperature of 140° F. being quite sufficient to fuse the phosphorus), and shake briskly until cold; when quite cold, put carefully in a mortar with the kaolin and powdered mastic, previously well mixed, until a uniform mass is obtained.

A 3-grain pill of the first mass contains $\frac{1}{32}$ grain of phosphorus in the free state, and a 2-grain pill of the second mass contains $\frac{1}{30}$ grain of the same.

The author recommends the second method particularly, and advises that the mass be kept in a covered pot, in boluses of about 2 drachms each, wrapped in wax paper to exclude air. He has, however, kept the different masses in good condition for several months without this precautionary measure.—Phar. Jour. and Trans., May 12, 1883, 923–926.

Ferrocyanic Pellets—A Clinical Test for Albumen.—These are made of sodic ferrocyanide and citric acid, and are recommended by Dr. F. W. Pavy as a chemical test for *albumen*, which see under "Organic Chemistry."

Pills of Lupulin and Camphor—Ether as Excipient.—Lupulin and camphor are not readily made into a plastic mass by excipients without increasing the size of pills very considerably. But with the addition of a small quantity of ether, a very serviceable mass is obtained, which, without any other addition, may be made into very small pills. Such pills should be made in moderate quantities only, sufficient to last about a week.—Amer. Jour. Phar., May 1883, 274, from Rundschau, 1883, W. 7.

RESINÆ.

Scammony-Resin—Preparation, etc., from Roots.—Mr. Charles A. T. Doench obtained 5·4092 % of resin from scammony root, by extracting it with alcohol, precipitating the concentrated tincture in water, washing, drying, re-dissolving in alcohol, again precipitating, and washing as before. Thus obtained, the resin was of a greenish-gray color, and answered the tests of the Pharmacopœia for the resin of scammony, its behavior showing a decided difference from that of some commercial scammony. Three samples of the latter were procured from different wholesale houses, and examined by treating 5 grams of each successively with ether, benzol, oil of turpentine, alcohol and water; each solution was evaporated by means of a water-bath, to dryness, and the residue weighed, when the following results were obtained:

	Soluble in					Insoluble.
	Ether.	Benzol.	Oil turp.	Alcohol.	Water.	matter.
I.	1·574	0·025	0·020	1·270	1·030	1·081
II.	1·173	0·023	0·720	0·303	1·574	1·199
III.	2·695	0·022	0·434	0·733	0·586	0·530

The ethereal extracts were dissolved in warm solution of potassa, and to the solution an excess of hydrochloric acid was added, which in each case produced a precipitate; this was weighed, the weight deducted from that of the ethereal extract, and the remainder regarded as pure scammonin, amounting in I. to .599 gram, or 11.98 per cent.; in II. to .546 gram, or 10.92 per cent., and in III. to 2.258 grams, or 45.16 per cent. The precipitate from I. was dark brown, and was not colored brown or cherry-red by concentrated sulphuric acid, nor did it acquire a blue color with oxidyzing agents, and was, therefore, neither rosin nor guaiac resin. The precipitates from II. and III. were light yellowish-brown, became dark red with sulphuric acid, and were regarded as consisting chiefly of rosin.—Am. Jour. Phar., Nov. 1882, 545–546.

Jalap Resin.—Percentage obtained from different specimens of *Jalap*, which see under "Materia Medica."

SAPONES.

Soft Soaps—Preparation, etc.—An interesting review of the character and preparation of soft soaps, such as "green soft soap," the so-called "natural grain soap," and the "transparent glycerol soap," taken from "Seifenfabrikant," 1881, (pp. 82, 83, 85, and 153,) is reproduced in Amer. Jour. Phar., Oct. 1882, 489–90, from Jour. Chem. Soc., Aug. 1882, and Dingl. Polyt. I., Vol. 244.

Oleic Acid Soap—Preparation.—A writer in "Chem. Centralbl."

(1882, 272) states that the manufacture of this soap, which is used chiefly for fulling purposes, is different from that of other hard soaps, because, owing to the rapidity with which the saponification is effected, the greater part of the lye must be in the copper before the oleic acid is added. Oleic acid, like rosin, works best in carbonated lyes; hence, in preparing oleic soap, ash lyes of 20°–50° B. are used. The saponification is effected in the following manner:

2,000 lbs. lye of 20° B. are run into the copper, and when it boils, 1,000 lbs. of oleic acid are added, stirring the mixture constantly. 500 lbs. of oleic acid and 700 lbs. of soda-lye (20° B.) are then introduced in successive portions. When the saponification is at an end, common salt is added. The soap is now boiled until it becomes clear. It is then kept at rest for 12–18 hours in the covered copper, after which it is poured into the frames. The resulting product exhibits a silvery appearance, is firm, and has an agreeable smell.—Jour. Chem. Soc., Sept. 1882, 1016.

Soap.—Application of a solution to the estimation of the hardness of *water*, which see under "Inorganic Chemistry."

Soap with Silicate of Sodium.—The properties of soap and of silicate of soda possess great analogy. The combinations of weak acids possess a slightly alkaline reaction, their solutions being capable of forming an emulsion with fatty substances. These properties in common have led to the manufacture of cheap soaps, containing a large proportion of silicate of soda or soluble glass. Two processes may be employed: (1) the addition of a concentrated solution of silicate of soda to fatty or resinous soap, and (2) the saponification of fatty or resinous substances by alkalies in the presence of silicate of soda. By either method a soap is obtained, suitable for all the uses to which ordinary soap has hitherto been applied, and at a much lower price, as silicate of soda is extremely cheap.—New Rem., Jan. 1883, 25.

Castor Oil Soap—New Formula.—M. S. Hammer gives the following formula for preparing this soap: Saponify castor oil Oij with caustic potassa ℥vj and water Oij by heating until a transparent mixture is obtained, then add a saturated solution of 8 ounces of sodium chloride, stir until cool, allow to subside for a day, decant the liquid portion, cut in pieces and dry for use.—Amer. Jour. Phar., May 1883, 271, from Proc. Cal. Phar. Soc., 1883, 50.

SPIRITUS.

Aromatic Spirit of Ammonia, B. P—Improved Process for Preparation.—Dr. Thresh reviews the history of aromatic spirit of ammonia and of the formulas of the British, French, Belgian, and United States Pharmacopœias. He regards the formulas of the United States and Belgian Pharmacopœias to be reliable, but neither of them as good as the formula of the British Pharmacopœia, for which he proposes the following modified process, and which he thinks is most likely to supersede the present one:

Take of Oil of lemons	ʒ viss.
Oil of nutmeg	ʒ ivss.
Rectified spirit	6 pints.
Water	3 pints.

Distil 7 pints, set this apart; then continue the distillation until 9 ounces more have been collected:

Take of Ammonium carbonate	4 ounces.
Stronger solution of Ammonia	8 "
The last portion of the above distillate	9 "

Place in a bottle holding a little more than a pint, cork securely, and place the bottle in a water bath at about 140° F (though solution may be effected less readily without heat), shaking from time to time until all the salt has dissolved. When cold, filter if necessary through a little wool, and pour into it gradually the seven pints of distilled spirit.

The product will measure 1 gallon; its specific gravity is .886, and it contains 3.45 per cent. of normal ammonium carbonate and 1.23 per cent. of free ammonia. Being more dilute than the officinal (B. P.) spirit, none of the carbonate is thrown out of solution even at 0° C.—Phar. Jour. Trans., Feb. 17, 1883, 661–663.

Spirit of Nitrous Ether—Commercial Quality and Preparation.—Mr. H. T. Eberle has communicated the results of an examination of commercial specimens of spirit of nitrous ether. The determination of the amount of real ether is that known as Hoffmann's, and the results are tabulated as follows:

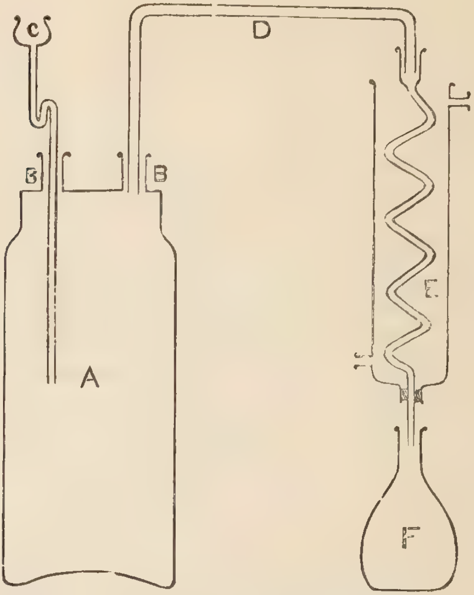
No.	Sp. gr.	Treated with dilute Liq. Potassa.	Bicarbonate of Potassa.	Litmus Paper.	Water at 145° F.	Ether: %
1	.824	Light straw color.	No effervescence	Slight action.	Boiled.	4.2
2	.837	"	Very slight effervescence.	"	"	3.8
3	.838	Yellow	Slight effervescence	Reddened.	"	3.0
4	.903	Dark red	Effervescence	Red		1.12
5	.913	Red	"	"		1.22
6	.952	Dark red	"	"		0.6

Sample No. 1 was prepared by the formula of J. W. Mill, of which the following is a slight modification, suggested by a member of the Wisconsin Pharmaceutical Association as giving more reliable results than the process of the Pharm. of 1880:

Take of Nitric Acid, sp. gr. 1.42	12 ounces.
Alcohol Fortior	q s.
Potassa Carbonate	1 ounce.
Water	q s.

The distillation is conducted in a still of the pattern illustrated, Fig. 22, which can be easily and cheaply made by taking an ordinary Hero fruit jar (*A*), and into the top placing two thimbles (*BB*). Into these introduce the safety-tube (*C*) and the conducting pipe (*D*). Connect the latter with any good condenser, but the one shown in the cut (*E*) is considered most suitable, as it is all glass. The receiver (*F*) completes the outfit. Introduce 26 ounces of alcohol into the still; add 6 ounces of nitric acid, and apply heat by means of a water-bath until full reaction is established. Then withdraw the water from the water-bath. When the reaction lessens, add a portion of the remaining acid, and repeat until all the acid has been added. When the reaction is ended, add the carbonate of potassium to the distillate, together with twice its volume of ice water; shake well, separate the supernatant ether, measure it, and for each fluid-ounce of ether add 21 fluid-ounces of strong alcohol, and mix. The product contains 5 per cent. of nitrous ether by weight. Ice and salt should be packed about the receiver (*F*), and all the joints of the apparatus must be well luted with a paste of flaxseed and lime water.—Pharmacist, Jan. 1883, 4–7.

FIG. 22.



Apparatus for Distilling Spirit of Nitrous Ether.

Spirit of Nitrous Ether.—A sensitive reagent for *Carbolic Acid*, which see under "Organic Chemistry."

Eau de Cologne—New Formula.—A very pleasant and refreshing Eau de Cologne, much resembling that sold with the trade-mark "Springbrunn," may be obtained as follows:

Dissolve 15 parts of oil of orange-peel, 15 of oil of lemon, and 6 of oil of bergamot, in 3,000 parts of finest cologne spirit. (It is absolutely necessary that only the purest and finest oils and alcohol be used.)

Also dissolve 1 part of oil of neroli (pétale) and 1.5 parts of oil of orange (petits grains) in 1,000 parts finest rectified rye-spirit.

After standing for five or ten days, both liquids are mixed. It is best to distil the mixture, since the odors are better blended thereby; but it may also be aged by allowing it to stand for a time.

To the distillate are added 2 parts of the finest oil of rosemary, and the liquid then put up in small, well-corked vials, which must be kept in a cool, shady place.—New Rem., Feb. 1883, 54.

Eau de Brettfeld—A New Toilet Water.—Digest 230 parts of Florentine orris-root with 2,000 parts of Cologne spirit for three days in a warm place. On the other hand, dissolve seventy drops of oil of lemon, 60 drops of pure oil of rose, 70 drops of oil of neroli (bigarade) in 300 parts of cologne spirit, and digest 0.15 parts of musk in the solution. Finally mix the two liquids and filter. The product has an agreeable violet-like odor.

The residuary orris-root may be used for other purposes, such as "pot pourri," etc.—Ibid.

Essence of Raspberry—Preparation from Fruit.—According to "Industrie Blätter," a concentrated essence, which keeps well, is prepared as follows:

Upon fifty pounds of the fresh and cleaned berries pour fourteen gallons of 85 per cent. alcohol; let it stand for twenty-four hours; then add about six gallons of water, and distill off thirteen gallons.

Essence of Strawberry is prepared in the same manner. The odor in both instances is developed in dilution, the essence itself not possessing a strong odor. A good coloring is the expressed juice of elder berries.—New Rem., Aug. 1883, 231.

SYRUPI.

Syrup of Orange Peel—Preparation from the Fresh Peel—Mr. E. H. Hollister contributed the following formula at a meeting of the Wisconsin Pharmaceutical Association: Cut two ozs. of fresh orange peel in small pieces; put in a mortar and add 2 ozs. alcohol; thoroughly bruise to a pulp; transfer to a glass percolator, and percolate with water until 9 ozs. of percolate are obtained. Place 14 ozs. of sugar into a percolator, and percolate the liquid through the sugar until dissolved.—Pharmacist, Nov. 1882, 404.

Syrup of Senega—Preparation.—Experiments made by Mr. Daniel

Hirth show that the officinal process (Phar. 1870) for syrup of senega does not produce a clear preparation, and that it is apt to crystallize. A number of different methods were pursued, and good preparations obtained by several. Among them the following: Two fluid ounces of fluid extract of senega are evaporated to one fluid ounce, three fluid ounces of water are added, and the liquid is filtered. Six Troy ounces of coarsely powdered sugar are then dissolved in the filtrate by the aid of gentle heat.—New Rem., Nov. 1882, 323.

Syrup Tolutanus—Improved Process.—Malenfant gives the following process as yielding the best results: The white of one egg is well beaten and mixed with 1000 gm. of water and 250 gm. of tincture of tolu. This mixture is added to a mixture of 10 kilos of granulated sugar and 5 kilos of water, and the whole then rapidly heated to boiling, without removing the scum; finally, when clear, the syrup is strained or filtered. Rundschau, 1883, W. 7, from Jour. de Phar. et de Chim., in Amer. Jour. Phar., May 1883, 274.

Syrup of Squill—New Formula.—Mr. R. Rother gives in detail some objections to the use of acetic acid in this preparation, and offers the following as a substitute for the officinal process:

Take of Squill, whole	10 troy ounces.
Sugar, granulated	96 "
Alcohol Water	of each sufficient.

Mix alcohol and water in the proportion of one measure of the first and seven measures of the second, and pour 57 fluid ounces of the mixture upon the squill contained in a wide-mouthed bottle. Macerate this mixture for three or four days, with occasional shaking, and decant 32 fluid-ounces of the liquid. Upon the residue pour 32 fluid ounces of the menstruum, and after 3 or 4 days decant as before. Mix the two decantates, filter and pour the filtrate on the sugar contained in an appropriate vessel; stir the mixture until most of the sugar is dissolved, decant about six pints of the syrup, heat the residue until dissolved, then mix the whole, and strain.

The author also criticises the formula for *Syrup of Ipecac*, for which he offers the following as a substitute:

Take of Ipecac, coarsely bruised	4½	troy	ounces.
Sugar, granulated	48	"	"
Calcium carbonate	½	"	ounce.
Ammonia water	¼	fluid	"
Alcohol Water	of each sufficient.		

Mix alcohol and water in the proportion of one volume of the first and seven of the second, and pour 25 fluid ounces of the mixture together with the ammonia water upon the ipecac contained in a wide-mouthed bottle. Macerate the mixture for 3 or 4 days, shaking it up occasionally; then decant 16 fluid ounces of the liquid. On the residue pour 16 fluid ounces of the menstruum, and after 3 or 4 days' maceration decant 16 fluid ounces as before. Mix the two decantates, add the calcium carbonate, agitate and filter. Pour the filtrate on the sugar contained in a proper vessel, stir until most of the sugar has dissolved, and decant about 3 pints of the syrup. Heat the remainder until solution is effected, then mix the whole and strain.

With the syrup so prepared, the

Compound Syrup of Ipecac, a substitute for Dover's powder, is conveniently prepared, and furnishes a more permanent and elegant syrup than the formulas in general use.

Take of	Deodorized tincture opium	8 fluid drachms.
	Syrup of ipecac	10 "
	Simple syrup, sufficient to make	75 "

Mix.

The product contains ½ grain each of opium and ipecac in the fluid-drachm.—Amer. Jour. Phar., Feb. 1883, 83–86.

Syrupus Ferri Phosphatis, B. P.—New Method of Preparation.—Mr. Daniel Gorrie observes, in reference to this syrup, that there are two sources of dissatisfaction, (1st) in its preparation, and (2d) in its tendency to spoil by keeping. He recommends the following method, which is intended to overcome these objections, and has as its main feature the constant retention of the iron in solution.

Take of	Granulated sulphate of iron	224 grains.
	Syrupy phosphoric acid (sp. gr. 1.5)	9 drachms, 56 grains.
	Pure carbonate of baryta	159 grains.
	Distilled water	6 ounces, or q. s.
	Refined sugar	8 ounces.

Mix the phosphoric acid with three ounces of water, and in the mixture dissolve the sulphate of iron, with the aid of heat; add the carbonate of baryta, and, when effervescence has ceased, continue to heat for a few minutes, to allow the precipitate to aggregate, then allow to cool. Filter when cold, and wash the precipitate with three ounces of cold distilled water; in the filtrate dissolve the sugar without heat, and make up to 12 ounces if necessary. The author admits that objections may be urged on account of the possible introduction of phosphate of barium, held in solution by the phosphoric acid; but he contends that with pure material and careful manipulation, there is no danger of such introduction.—Phar. Jour, Trans., Dec. 23, 1882, 502.

Syrup of Phosphate of Iron—Novel Mode of Preparation.—Place at the bottom of a beaker or flask a strip of platinum foil, and over it 2 ounces of fine iron wire. Then pour in 1 pound of dilute phosphoric acid Ph. B. [corresponds to 10 per cent., by weight, of anhydrous phosphoric acid, or the same as that of the U. S. P. of 1882.—Ed.]. The iron soon dissolves under the influence of the electric current excited, and the action should be allowed to go on for a day or two, or until the formation of a light-blue cloud shows that the acid has formed as much of the salt as it can hold in solution. Then filter through white blotting paper, add 1 ounce more of acid, 24 ounces of white sugar, and 8 fluid ounces of syrup of black currants. This will make 3 pounds of a very pleasant non-styptic syrup, with an average dose of one teaspoonful, and costing altogether (without the platinum foil, which is, of course, unaffected) but 2*s.* [about 50 cents]. Syrup of black currants is very nice, and costs but 3*d.* [6 cents] a pound. Ordinary sulphate of iron, in 1 or 2 grain doses, in this syrup, seems as nice and as efficacious as the more popular phosphate.—New Rem., Feb. 1883, 57, from Br. Med. Jour.

Syrup of Hydriodic Acid—Modified Process.—Mr. R. H. Kimball gives a working process for the preparation of syrup of hydriodic acid, in which the intervention of bisulphide of carbon, as a solvent for the iodine, facilitates the conversion of the latter into hydriodic acid. One ounce of iodine is suspended, tied in a piece of muslin, in a wide mouthed bottle containing six ounces of bisulphide of carbon. When the iodine is all dissolved, six ounces of distilled water are added, and a current of sulphuretted hydrogen is passed through the mixture until the lower stratum of liquid has acquired a pale yellow color. The upper, milky layer is then carefully and completely decanted by means of a syphon, filtered, and the clear filtrate heated to drive off excess of sulphuretted hydrogen and adhering bisulphide of carbon. The cooled contents are then mixed with the necessary quantity of syrup.—New Rem., Jan. 1883, 10.

Syrup of Yerba Santa—Preparation and Value for Disguising the Taste of Quinine.—Mr. R. Rother observes that this syrup is growing in popularity as a vehicle for quinine in a tasteless form. It is best prepared by percolating one ounce of the leaves, in coarse powder, with an aqueous menstruum containing one drachm of ammonia water and two fluid ounces of alcohol in the pint, until one pint of liquor is obtained, and dissolving twenty-eight troy-ounces of sugar in this, with a gentle heat. This syrup is clear and bright, having a deep brown-red color, and slightly bitter, but pleasant honey-like taste.

The author finds the active agent to be an acid resin, which may be named *eriodictyonic acid*, and which forms a nearly insoluble salt with quinine (see *Quinine Eriodictyonate* under alkaloids).—Amer. Jour. Phar., April 1883, 175–176.

Syrup of Corn Silk—Preparation.—Mr. John H. Hurty contributes the following formula, which gives a permanent and handsome preparation.

Beat 2 ozs. of *green* corn silk to a pulp with eight fluid ounces of a mixture of 6 ozs. of water and 2 ozs. of alcohol (by weight?—Rep.). Transfer the pulp to a percolator, macerate for 24 hours, then percolate by the aid of sufficient menstruum of the same strength until 8 ozs. of percolate are obtained. In this dissolve 8 ozs. of sugar by agitation. Dose, one or two teaspoonfuls every two to four hours.—Drug. Circ., Feb. 1883, 23, from "Indiana Pharmacist."

Aromatic Syrup of Liquorice—New Process.—Having frequent demands for syrupus glycyrrhizæ aromaticus in combination with salts of quinine, Mr. Allen Shryock has adopted the following formula, by which a preparation is obtained not only disguising the bitterness of the alkaloid, but also imparting a delicate aromatic and astringent flavor.

Take of	Extractum glycyrrhizæ fluidum	25 parts.
	Extractum aromaticum fluidum	10 "
	Mel Rosæ	15 "
	Syrupus.	50 "

Mix them.

—Amer. Jour. Phar., June 1883, 305.

Aromatized Syrup of Convallaria Majalis—Composition.—See *Convallaria Majalis* under "Materia Medica."

Syrups of Althæa and Almond.—"The Druggist" (March, 1883,) observes that the introduction of the latter syrup into the pharmacopœia is of very doubtful utility; but since both are very much given to decomposition, it is advisable to introduce 5 per cent of deodorized alcohol, whereby fermentation will be effectually warded off, while to the alcohol there can exist not the slightest objection. The injunction of the Pharmacopœia to prepare the syrup of althæa only as called for, will rarely be followed, as very few druggists will attempt to manufacture half an ounce of the article each time it is prescribed and the patient waiting.—New Rem., May 1883, 158,

Amussat's Laxative Syrup—Process of Preparation.—In the Gazette Hebdomadaire, 1882, No. 22 (Lyon Medical, June 4, 1882), the following formula fòr the preparation of the "sirop laxatif d'Amussat," or "sirop de suc d'herbes" is given. Rasped guaiacum wood, chicory root, burdock root, waterdock root (racine de patience), fumitory tops, tops of viola tricolor arvensis, (pensée sauvage), each 100 grams; senna leaves, 500 grams. Bruise the materials and infuse for 12 hours with 5 kilograms of boiling water. Strain, and make a second infusion with three kilograms of water. Strain under pressure, filter through paper, and make with honey and sugar, each 3 kilograms, a syrup, which is also to be filtered through paper, and which should be of the density of 31° Baumé. Dose, one to two tablespoonfuls a day.—Amer. Jour. Phar., Mar. 1883, 152, from N. Y. Med. Jour. and Obst. Rev., October.

TINCTURÆ.

Tinctures—Relative Strength of those of the Pharmacopœias of 1870 and of 1880.—Prof. John M. Maisch has compiled the results of several experimenters—Dr. Wolff, Messrs. Wiegand, Robbins and Lowe—made with a view to showing the practical difference in the strengths of certain preparations. They show that the *actual* differences in dispensing are not as great as the table of differences in the new Pharmacopœia would indicate, since the volume of the preparations is influenced by the variations in temperature, etc.

In the following table the lowest (*L*) and highest (*H*) weights are given, together with the mean (*m*) of all results; when only one determination was made, or when the results were identical, the weight has been placed in the column of average weights. The column giving the weight of active drug necessarily gives the theoretical weight U. S. P., 1870, without taking into consideration the actual variations in measure.

	Weight of 1 fluidounce.						Active drug in 1 fl oz., weight in grains.			
TINCTURA.	U. S. P., 1870.			U. S. P., 1880.			U. S. P., 1870.	U. S. P., 1880.		
	L.	H.	m.	L.	H.	m.		L.	H.	m.
Aconiti rad	383	395	389	379	385	383	180	151	154	153
Belladonnæ	422	443	433	417	434	425	60	62.5	65.1	63.7
Calumbæ	. .	. .	. .	408	423	415	60	40.8	42.3	41.5
Capsici	417	428	423	. .	. .	389	15	. . .	. . .	19.5
Cardamomi	418	455	436	. .	. .	440	60	. . .	. . .	66
Cardam. comp	. .	. .	448	410	438	420	21	20.5	21.9	21
Cinchon. comp.	. .	. .	. .	406	408	407	48	40.6	40.8	40.7
Cinnamomi	403	424	414	. .	. .	415	45	. . .	. . .	41.5
Digitalis	424	442	435	. .	. .	444	60	. . .	. . .	66.6
Gentianæ comp.	. .	. .	444	419	452	433	30	33.5	36.1	34.6
Hyoscyami.	420	435	428	. .	. .	438	60	. . .	. . .	65.7
Iodi	. .	. .	. .	394	400	397	29	31.5	32	31.7
Krameriæ.	. .	. .	426	. .	. .	426	90	. . .	. . .	85
Lavand. comp	. .	. .	393	. .	. .	408				
Lobeliæ.	. .	. .	433	. .	. .	427	60	. . .	. . .	85
Myrrhæ.	. .	. .	391	370	376	373	45	74	75.2	74.6
Nucis vom.	. .	. .	387	. .	. .	375	12*	. . .	. . .	7.5
Opii	. .	. .	. .	420	447	435	37.5	42	44.7	43.5
Opii camph	. .	. .	. .	427	440	435	1.8	1.71	1.76	1.74
Opii deodor	441	454	448	. .	. .	455	37.5	. . .	. . .	45.5
Sanguinariæ	. .	. .	406	. .	. .	423	60	. . .	. . .	63.4
Valerianæ	. .	. .	436	420	424	422	60	84	84.8	84.4
Spir. camphor	. .	. .	. .	. .	. .	380	56	. . .	. . .	38

* Extract = 120 grains of nux vomica.

The tincture which has attracted most attention is tinctura opii, the strength of which, under the instructions of the Convention, was increased about 14 per cent. (one-seventh), with the view of decreasing that of the wine and vinegar of opium, and thus rendering all the strong liquid opium preparations of uniform percentage strength. To what slight extent this change of the tincture affects the dose is readily seen by comparing the former theoretical strength with the results practically obtained with the new tincture:

	U. S. P.,, 1870.	U. S. P., 1880		
		L.	H.	m.
One grain of opium is contained in	12.8	11.43	10.74	11.04 min.
10 minims represent powdered opium,	.781	.875	.931	.917 grs.

It is obvious that the difference would be still less if the new tincture had been measured at our average summer temperature. Owing to the larger amount of water contained in the deodorized tincture of opium, this represents one grain of opium in 10.5 minims.—Amer. Jour. Phar., June 1883, 310, 313.

In connection with the above it must be noted that Prof. O. Oldberg discusses the various objections that have been urged against the new Pharmacopœia, and answers them in a clear and convincing way. Of all the different preparations that have been changed there are only about sixteen that could possibly be considered hazardous on account of either increase (7) or decrease (9) in strength. The abolition of fluid measure was done in obedience to instruction received, its aim being greater exactness, whilst it does not necessitate the prescribing and dispensing by weight. The forced introduction of the metric system of weights upon an unwilling constituency is not true, and Prof. Oldberg shows why it is not true. He concludes as follows: "All who have the best interests of medicine and pharmacy at heart will try to build up, instead of tearing down, the national standard, and will seek to find out its real defects, not to condemn the book, but to improve it." With all the care that has been bestowed upon it for years, there are shortcomings which it is the duty of every pharmacist and physician to assist in remedying.—See Amer. Jour. Phar., June 1883, 335–336.

Tincture of Arnica—Improved Process.—Mr. Chas. H. Hæntze proposes the following, which slightly deviates from the U. S. P. process, but gives a preparation which does not form a precipitate:—Take of arnica flowers 6 troy ounces; alcohol 1½ pint; water ½ pint. First take the arnica flowers and rub in a mortar with 2 drachms of sodium carbonate until quite fine, then take the powder and put in a 2-pound tin percolator of the Rosenwasser pattern, and percolate with the diluted alcohol, raising the reservoir about five feet above the percolator; the result is a quart of dark, clear and strong tincture, and as the quantity of carbonate of sodium is so small, it would be hardly objectionable. This same tincture may be made by maceration, but as the latter takes up a great deal of precious time, the former way is preferable.—Amer. Jour. Phar., Sept. 1882, 435.

Tincture and Liquid Extract of Opium—Strength of English Commercial Samples.—Mr. John Woodland has made several determinations of the strength of different samples of tincture and of liquid extract of opium, with the results given in the following tables:

TINCTURE OF OPIUM.

NO. OF SAMPLE.	CHARACTER OF RESIDUE OF EVAPORATION.	PERCENTAGE OF RESIDUE.	PERCENTAGE OF MORPHINE.
1	Resinous	4.35	.62
2	"	3.21	.41
3	"	3.93	.45
4	Oleaginous	4.81	.38
5	Resinous	4.22	.61
6	"	4 51	.59
7	"	5.01	.68
8	"	3.56	.32
9	"	3.41	.45
10	"	4.67	.70
11	"	3.82	.51
12	Oleaginous	5.11	.41
13	Resinous	4.28	.65
14	"	4.54	.69

NO. OF SAMPLE.	PERCENTAGE OF RESIDUE.	PERCENTAGE OF MORPHINE.
1	4.47	.37
2	3.39	.21
3	4.45	.30
4	4.71	.36
5	3.11	.19
6	3.40	.23
7	4.92	.37
8	4.21	.31
9	3.85	.21
10	3.02	.22

The standard morphia strength of the opium of the B. P. being 8 or 10 per cent., the author accepts 8 per cent. as within the requirement of that standard. Tincture of opium should, therefore, contain .6 per cent. and the liquid extract should contain .38 per cent. of morphine. None of the last named, however, reached this standard, whilst in the case of the tincture, some of them were above the standard, though the majority were below, and in most cases, very considerably.—Year-book of Phar., 1882, 514–516.

Tincture of Nux Vomica—Addition of Salt to Menstruum for Securing Complete Exhaustion.—R. Rother finds that the addition of a small percentage of a saline substance to the menstruum greatly facilitates the extraction of nux vomica, and in accordance with this observation recommends the following formula and method for the preparation of the tincture:

Take of Nux vomica, in fine powder	8 troy ounces.
Sodium chloride	6 drachms.
Alcohol Water	of each 1½ pints.

Dissolve the sodium chloride in the water; then add the alcohol, and mix them. Upon 2 troy ounces of the nux vomica, contained in a large capsule, pour 2 fluid ounces of the menstruum, and mix them by means of a pestle; then gradually add the remainder of the nux vomica, and thoroughly mix the whole as before. Pack this mixture very firmly into a cylindrical glass percolator, and pour on the menstruum little by little until, in the course of six to eight hours, the liquid has descended to the bottom of the column. Now suspend the operation, and after twelve hours pour on more of the menstruum, and regulate the flow at the exit so that after twenty-four hours 2 pints of percolate may be obtained. To avoid a trace of turbidity, which is liable to appear in the first fluid ounce of percolate when the menstruum is added too rapidly at first, 1½ drachm of the sodium chloride may be mixed with the nux vomica before packing, and the remainder dissolved as before. The finished tincture contains ¼ grain of sodium chloride in 15 minims.—Amer. Jour. Phar., Jan. 1883, 1–3.

Deodorized Tincture of Opium—Modified Process of Preparation.—Mr. R. Rother's experiments, conducted with the idea that some fixed oily substance would effect the removal of resinous and odorous matter from opium, lead him to recommend the following formula, which has been so successfully and expeditiously used by him, that he thinks it may well replace that for ordinary tincture of opium.

Take of Opium dried and powdered	2½ troy ounces.
Vaselin Spermaceti } of each	1 troy ounce.
Alcohol	7 fluid ounces.
Water sufficient.	

Upon the opium contained in a suitable capsule, pour 12 to 14 fluid ounces of water, and boil the mixture 10 to 15 minutes; then add the spermaceti and vaselin, stir them well together, let the mixture cool, and decant the liquid from the dregs. Upon the residue pour 8 fluid ounces of water, again heat the mixture, stir it well, and after cooling, decant as before. Repeat this operation once more with 8 fluid ounces of water, or sufficient to make the mixed decantates measure 25 fluid ounces. Mix the three decantates, let the mixture become cold, filter, and finally add the alcohol.—Amer. Jour. Phar., Feb. 1883, 76–78.

Tinct. Camphoræ Composita B. P.—Observation Regarding the Insolubility of Oil of Anise.—Mr. J. Blaud, having had difficulty to secure the complete solution of the oil of anise, in making this preparation (corresponding to tinct. opii. camphor. U. S. P.), has made some experiments which lead him to the conclusion that the volatile oil of *Pimpinella anisum* will dissolve completely in the preparation, whereas that of *Illicium anisatum*, which is commonly used, will not dissolve. From the difficulty which the author had in procuring authentic samples of true oil of aniseed, he infers that practically the whole of the oil of aniseed of commerce is derived from star-anise.—Phar. Jour. Trans., Nov. 4, 1882, 363.

Tincture of Rhubarb—Modification of Officinal Process.—Mr. Edgar C. Maxcy has experimented with several formulas, and finds the following to give a beautiful bright liquid which, he thinks, is not liable to precipitate like the officinal tincture of rhubarb:

Rubarb in No. 40 powder	1 ½	ounces.
Cardamom. in No. 40 powder	¼	"
Glycerin	2 ½	"
Stronger alcohol	8 ½	"
Water	3	"
Diluted alcohol	q.	s.

Mix the alcohol, water and glycerin, moisten the powder with one-half fluid ounce of the mixture, and after allowing it to stand fourteen hours in a closed vessel, pass through a sieve of twenty meshes to the linear inch and pack quite firmly in a glass funnel. Pour on the menstruum, and when the liquid has passed through the powder to the mouth of the funnel, cork the outlet for eight hours, and then continue the percolation with diluted alcohol until one pint of finished product is the result.—New Rem., Dec. 1882, 354.

Essence of Green Ginger—Preparation.—In view of the increased demand for an essence of ginger that shall mix with water without producing a turbid mixture, Mr. C. Symes has made some experiments with "green" ginger, imported from Rio Janeiro. He found that the decorticated rhizome, which had been surface-dried by exposure for a few hours to the air, when sliced thinly, macerated for some days with an equal weight of rectified spirit, and filtered, yielded an essence possessing a very fine aroma, and which when mixed with water scarcely rendered it turbid in the least degree. It is fairly strong, and could doubtless be prepared stronger were the drying carried a little further.—Phar. Jour. Trans., April 7, 1883, 819.

Compound Tincture of Cinchona—Removal of Stains upon Containing Vessels.—Dr. Henry H. Wetherill, having found the red stain produced by tincture cinchona comp. upon bottles in which it is kept very difficult to remove, experimented with several solvents, and, taking advantage of the well-known solubility of cinchonic red in alkalies, found that the ordinary strength aqua ammoniæ dissolves it at once and completely, no matter how old or dry it may be.—Amer. Jour. Phar., Dec. 1882, 628.

Tincture of Castor.—Test of quality. See *castor* under "Materia Medica."

Tincture of Iodine—Preparation with Methylated Spirit.—Mr. E. Gregory, having prepared some tincture of iodine in the U. S. P. proportions, but substituting for alcohol the methylated alcohol of British (Canadian) commerce, observed that after a time the tincture attained an irritant character far beyond that of the ordinary tincture. The preparation also acquired an extremely pungent, somewhat garlicky odor, from which Mr. Gregory infers that the methylated spirit contained some alcohol from which some iodoallyl compound was formed.—Can. Phar. Jour., June 1883, 333, 334.

Tincture of Iodine—Preservation.—J. Casthelaz takes advantage of the oxidation of hydriodic acid by iodate of potassium to counteract the change which takes place where tincture of iodine is kept. To every 130 grams of tincture of iodine of the French codex (120 alcohol of 90 per cent., and 10 iodine) 1 gram of iodate of potassium is added, which is capable of reducing 3.58 grams hydriodic acid with the formation of 3.56 grams iodine, or more than one-third of the total iodine present. The proportion of iodine is thus kept constant. The maximum quantity of iodide of potassium which can be formed, 0.59 per cent., is so small as not to interfere with the action of the tincture, and therefore may be neglected.—Jour. Chem. Soc., Sept. 1882, 1010, from Jour. de Pharm. (5), 5, 498–499.

Tinct. Iodine—Addition of Salt to Promote Solubility of Iodine.—Mr. Fred. C. Lehman, jr. has observed that if a small quantity of chloride of sodium is added to the mixture of iodine and alcohol, solution of the iodine is effected very rapidly by simple agitation.—Amer. Jour. Phar., Mar. 1883, 145.

Tincture of Iodine—Advantage of the Addition of Chloride of Sodium.—Mr. H. C. C. Maisch communicates some experiments which seem to show that the addition of salt in the preparation of tincture of iodine aids the solution of the iodine only mechanically, and that a compound of sodium and iodine is not formed.—Amer. Jour. Phar., May 1883, 231–232.

Chloralated Tincture of Iodine.—Carlo Pavesi gives the following formula: Iodine, 20; chloral hydrate, 30; alcohol of 36°, (sp. gr. .958?) 140 parts. The solution takes place without decomposition and the preparation is miscible with water without precipitating. It is of a pure golden hue, has the odor and taste of its ingredients, coagulates albumen readily, and is an excellent hemostatic and very useful in the treatment of large wounds as an antiseptic and hypnotic.—Io. Spallanzani—Amer. Jour. Phar., Oct. 1882, 518, from "Medical Record."

Compound Tincture of Cajuput—Formula.—Oil of peppermint, oil of cloves, oil of cajuput, oil of anise āā ℥j, alcohol ℥iv. Mix. It is a powerful stimulant.—Eclec. Med. Jour., 1883, p. 45.

Tinctura Dentifricia.—Dissolve kino and extract of krameria, each 100 parts, in alcohol, 1,000 p., and add tincture of tolu, tincture of benzoin, oil of peppermint, each 2 p., and oil of anise 1 part.—Monit. Méd.

MISCELLANEOUS SUBJECTS.

Elixir Cascara Sagrada—Formula.—W. T. Wenzell recommends the following: Fluid extract of rhamnus Purshiana f.℥iv, simple elixir f.℥xxvij; potassium carbonate ʒij.—Amer. Jour. Phar., May 1883, 252, from Proc. Cal. Phar. Soc., 1883.

Glycerite of Birch Tar has been successfully used in eczema by E. Johanson; it was prepared by mixing one part of birch tar with eight parts of glycerin, the latter previously diluted with one-fifth water.—Amer. Jour. Phar., Sept. 1882, 454, from Phar. Zeit. Russl., No. 21.

Saccharate of Coffee—Preparation.—Mr. Carlo Pavesi describes a new method of concentrating the valuable and useful constituents of coffee, as follows:—Best roasted coffee 1 part; refined sugar, 2 parts; warm water, q. s. The coffee is exhausted, in a convenient displacement apparatus, by means of the warm water; the clear, brown percolate is mixed with the sugar, and evaporated at a temperature not exceeding 50° C. (= 122° F.), in a suitable apparatus, to dryness. Finally, it is reduced to powder, and kept in well-closed bottles. The evaporating vessel should be shallow; or, better still, a vacuum pan should be used. Dissolved in boiling water, it gives a very fine cup of coffee. If made into a paste with tragacanth, it may be formed into tablets or troches—a very convenient form of use.—New Rem., Aug. 1882, 232; from Annali di Chim., 1882, 221.

Infant Food—A Good Substitute for Human Milk.—Dr. S. B. Sherry, of Delafield, Wis., recommends the following formula for a substitute for human milk: Add a pint of boiling water to an ounce of *pearl barley;* allow it to cool, and then strain it. Mix one-third of a pint of this barley-water with two-thirds of a pint of fresh, undiluted cow's milk, and sweeten with a teaspoonful of *milk-sugar.*—New Rem., May 1883, 146, from Amer. Jour. of Obstet.

Bougies—Preparation.—Labler manipulates as follows: White gelatin 2 parts is dissolved in water 8 parts, and glycerin 1 part, and the solution heated in a water-bath, until a drop of it placed upon a glass or marble slab has the proper consistence after cooling; the necessary quantity of tannin (?), iodoform, etc., dissolved in, or triturated with a little water, is then added, the whole stirred and heated until the water has been evaporated, when the mass is sucked up in glass tubes of the requisite diameter. The glass tube is closed with the finger, and then laid upon a cool slab. The glass tube having been previously cut with a file near the middle, and united again by pasting a strip of paper around the joint, the paper is soaked off, the two halves of the tube are sufficiently pulled apart, so as to withdraw a small portion of the bougie, and by means of the spritz a little water is dropped between the glass and the mass, when the latter may be easily withdrawn from one-half of the tube, and after a similar manipulation, also from the other half. In this manner bougie 0.5 meter long may be easily obtained, and afterwards cut to suit.—Amer. Jour. Phar., Feb. 1883, 99, from Rundschau, 1882, p. 676; Casopis cesk. lék.

Chloride of Zinc Tow—Preparation and Uses.—Mr. Edward Hirschsohn communicates some experiments which show the advantages of chloride of zinc tow as an antiseptic dressing over the prepared tows (simple, sulphurized, chlorinated, etc.) hitherto in use. The preparation is as follows:

Commercial, crude tow is thoroughly carded, then boiled for half an hour with 10 or 15 times its quantity of a 10 per cent. solution of chloride of zinc, in a kettle which can be closely covered. It is then pressed between two hinged boards, and dried in thin layers, at the ordinary indoor temperature. When dry, it is either at once carded, or it may be preserved uncarded in waxed paper.

If the tow is to contain 10 per cent. of chloride of zinc, a 7 per cent. solution of the dry salt is taken; and for a 5 per cent. dressing the strength of the solution is reduced to 3½ per cent.

When thus prepared, and particularly after being several times carded, the prepared tow is quite soft, and advantageously replaces salicylated cotton, owing to its cheapness.

Tow (or oakum) may also be impregnated with other antiseptics, such as carbolic, salicylic and boric acids, iodoform, etc., by slightly modifying the above process, as I have found by preliminary trials. Special directions for their preparation will be published at some future time.—New Rem., April 1883, 99–100.

Disinfecting Pastilles—Preparation.—Mr. C. Tanret has been very successfully endeavoring to make fumigating pastilles that should be not merely pleasantly odoriferous but disinfecting. Pastilles made in the ordinary way with charcoal, nitre and the usual sweet-smelling compounds, may be soaked in liquid antiseptics like creasote and eucalyptol, or if solid like carbolic acid and thymol, the disinfectant may be melted at a low heat, and dropped upon them until they will absorb no more. An eighth of an inch or so of the apex of the cone must be left free, otherwise the pastille will not light. It is better to drop a determinate quantity of the disinfectant on each pastille, as by soaking, if very porous, they are liable to imbibe too much to burn steadily, besides which, in the case of thymol and carbolic acid, crystals will form on the surface. During the combustion of these antiseptic pastilles there is an actual distillation of the antiseptic, which passes off into the air of the room in which they are burnt, in the form of vapor, very little of it being decomposed by the heat, both creasote and carbolic acid, for instance, being themselves produced at a high temperature. This is easily proved by the characteristic odor of the vapor. Although the thymol pastilles only contain half as much of the disinfectant material as those made with carbolic acid, they are, nevertheless, twice as strong as the latter, the disinfecting powers of carbolic acid and thymol being as 1 to 4, according to Kuhn and Jalan de la Croix. No doubt the inhalations of the fumes of such pastilles would be of great service in diseases of the respiratory organs.—New Rem., May 1883, 140, from Rép. de Pharm.

Glacialin—A New Antiseptic.—According to Dr. Besana, this substance, which has met with so much favor in England and elsewhere as an antiseptic, especially for the preservation of milk, meat, and other articles of food, has the following composition: Boracic acid, 18 parts; borax, 9 parts; sugar, 9 parts; glycerin, 6 parts. A Roman composition of a similar kind was found to be nothing but pure boracic acid. It is called salt of glacialin, and sells at five francs per kilogram (about forty-five cents a pound), the market price of boracic acid being exactly half that rate.—Amer. Jour. Phar., Dec. 1882, 629, from Boston Journal of Chemistry.

Sanitas Fluid—A New Antiseptic.—See Sanitas oil, under *Volatile Oils*, "Organic Chemistry."

Disinfectants—Comparative Value.—The Imperial Board of Health of Berlin have published a number of experiments by Dr. Koch, made with a view to establish the true value of a number of reputed disinfectants. The results are very interesting, showing that carbolic acid is among the least effective. Such is also the case with sulphurous acid, chloride of zinc, etc. As regards remedies which prevent the further development of spores, the following results were obtained. The first number means retarding the development, the rest totally preventing it.

Corrosive sublimate	1 : 1,600,000	1 : 320,000
Oil of mustard	1 : 330,000	1 : 33,000
Arsenite of potash	1 : 100,000	1 : 10,000
Thymol	1 : 80,000	
Ol. terebinth	1 : 75,000	
Hydrocyanic acid	1 : 40,000	1 : 8,000
Oil of peppermint	1 : 33,000	
Chromic acid	1 : 10,000	1 : 5,000
Picric acid	1 : 10,000	1 : 5,000
Iodine	1 : 5,000	
Salicylic acid	1 : 3,300	1 : 1,500
Permanganate of potash	1 : 3,000	
Muriatic acid	1 : 2,500	1 : 1,700
Camphor	1 : 2,500	
Eucalyptol	1 : 2,500	
Benzoic acid	1 : 2,000	
Borax	1 : 2,000	1 : 700
Carbolic acid	1 : 1,250	1 : 300

But inasmuch as for purposes of disinfection the micro-organism must be killed, and in the shortest possible period, and the effect of retarding the development of the spores (antiseptic) is not sufficient, only the following remedies can, according to Koch's experiments, be said to be of value: corrosive sublimate, chlorine, bromine, iodine. Bromine in form of vapor is, as concerns rapidity of action, superior to chlorine or iodine.—New Rem., Oct. 1882, 305, from Med. and Surg. Rep.

Tamar Indien.—"L'Union Pharmaceutique" publishes the following formula for its preparation: Mix pulp of tamarinds 450 gm., powdered sugar 40 gm., powdered milk sugar 60 gm., glycerin 50 gm.; evaporate to the consistence of a soft extract and add powdered senna 50 gm., powdered anise 10 gm., oil of lemon 3 gm., tartaric acid 3 gm.; form this mixture into 100 boluses, and after exposing these to the vapors of water roll them in a powder composed of cream of tartar 5 gm., sugar and milk-sugar each 35 gm., tragacanth 3 gm., tartaric acid 2 gm., and red saunders 25 gm. Dry and wrap in tinfoil.—Amer. Jour. Phar., Jan. 1883, 309, from Jour. Phar. d'Als.-Lorr., 1883, p. 93.

Karlsbad Sprudel Salt.—Improved Process of Preparation.—This salt, which was formerly very improperly prepared (see Am. Jour. Phar., 1878, p. 474, and 1880, p. 133, 257), is now obtained by heating the spring water to boiling, filtering, evaporating and saturating the residue with carbonic acid from the springs. The composition of the salt is as follows: Sodium bicarbonate 35.95, lithium bicarbonate .39, sodium sulphate 42.03, potassium sulphate 3.25, sodium chloride 18.16, sodium fluoride .09, sodium borate .07, silicic anhydride .03, and ferric oxide .01 part. One liter of Sprudel water yields about 5½ grams of salt.

An *artificial* salt resembling the preceding is made, according to Prof. Harnack, by mixing exsiccated sodium sulphate 100 parts, sodium bicarbonate 80 parts, and sodium chloride 40 parts.—Amer. Jour. Phar., Aug. 1882, 408, from Phar. Centralb., 1882, No. 21, p. 241.

Asthma Cigarettes.—New Formula.—Impregnate well nitred paper with an alcoholic fluid extract of grindelia; let dry and use in cigarettes. Owing to the nitre they will continue to glow and develop.—Amer. Jour. Phar., April 1883, 200, from Medical Record.—N. Car. Med. Jour., Jan. 1883.

Brassicon.—A Remedy for Headache.—I. K. Müller (Phar. Zeitschr. Russl., 1882, 783), states that *Brassicon*, which for a long time has been used in the district of Kiew against headache, is prepared from oil of peppermint ʒss, volative oil of mustard gtt. vj, camphor gr. x, ether ʒj, alcohol ʒiij, and sufficient tincture of peppermint or of melissa, to impart the desired shade of color.—Amer. Jour. Phar., March 1883, 142.

Perfumery.—Mr. W. A. Wren contributes some interesting notes on the materials used in making the different perfumes, and gives a number of formulas for popular essences.—See New Rem., May 1883, 144–146, from "Chemist and Drug."

Perfumery—Formulas.—A. Vomácka recommends the following preparations as being of excellent quality; the alcohol used should be distilled from wine, except where otherwise directed.

Eau de Brettfeld.—Digest for 3 days orris root, 230 grams, in spirit of wine 2,000 grams, and add a tincture prepared from spirit of wine 300 grams, oil of lemon 70 drops, Turkey oil of rose 60 drops, oil of neroli bigarade 70 drops, and musk 0.15 gram.

Eau de Cologne.—Dissolve oil of orange and oil of lemon, each 15 grams, oil of bergamot 6 grams, in rectified spirit of wine 3,000 grams. Also dissolve oil of neroli petals 1 gram, oil of neroli bigarade 1.5 gram, in rectified spirit of rye 1,000 grams. After 5 or 10 days, mix the two solutions. The fragrance improves by age; but a more delicate odor is produced by distilling the mixture. To the distillate, oil of rosemary 2 grams is added.

Extrait d' Heliotrope.—Dissolve heliotropin 1 gram, in rectified spirit of wine 100 grams; the addition of ambergris 0.1 gram renders the perfume more permanent.

Sachet d' Heliotrope.—Dissolve heliotropin 1 gram, in spirit of wine 25 grams, and incorporate the solution with granulated orris root 200 grams; after partial drying in the air, put into suitable bags. Black silk absorbs the odor best and retains it longest; next follow, in the order given, blue, red, green, and yellow silk.—Amer. Jour. Phar., Feb. 1883, 102, through Rundschau, 1882, p. 651, from Casopis cesk. lék.

Cosmetic Preparations.—The following formulas for popular cosmetics, etc., are given in "New Remedies," Feb. 1883, 54.

Rose-Bandoline.—Digest 800 grains of tragacanth with 1 quart of rosewater for two days, at a gentle heat in a closed vessel. Strain the mixture, and perfume it with oil of rose.

Or, macerate 1 part of quince seed with 40 parts of rosewater for several hours, repeatedly agitating; strain the mixture, and perfume it with oil of rose.

Almond-Bandoline.—Prepared like the preceding, except that oil of bitter almonds is used for scenting.

If either of the above are wanted colored, an ammoniacal solution of carmine may be used.

Brilliantine.—Mix 1 part of glycerin with 3 parts of castor oil and 60 parts of alcohol.

Perfume according to taste.

Crême de Mauve.—Mix 1 part of glycerin with 1 part of alcoholic extract of jasmin, and color with a little fuchsine.

Used to impart gloss to the hair,

Oleolisse Tonique (de Piver).—Dissolve 5 parts of castor oil in 15 parts of alcohol, and flavor with oil of bergamot or oil of Portugal.

Hungarian Cosmetic.—Melt 30 parts of white wax on a water-bath, and add 20 parts of powdered almond soap, and 20 parts of a solution of 1 part of gum arabic in 60 parts of rose-water. Stir the mixture until it cools, and perfume it with 1 part of oil of bergamot, or ⅕ part of oil of rose.

By adding umber or lamp-black, the mass may be colored brown or black.

Bay Rum (artificial):

Tincture of bay leaves (1 of bay leaves, 10 of alcohol.)	6 oz.
Oil of bay	60 grains.
Borax	1 oz.
Carbonate of ammonium	1 oz.
Rose-water.	1 quart.

Extrait Végétal:

Essence of vanilla (1 of vanilla, 30 of alcohol.)	2 parts.
Extract of orange flowers	1 part.
" " jasmine	1 "
" " rose	1 "
" " tuberose	1 "
Alcohol	16 parts.
Rose-water	20 "

Amandine (for softening and beautifying the skin).—Make a syrup from 1 part of sugar and ½ part of water. Mix 8 parts of the syrup with 2 parts of almond soap cream, until a homogeneous mass is obtained, to which is to be added, under constant stirring, 200 parts of almond oil, previously perfumed with 2 parts of oil of bitter almonds, 2 parts of oil of bergamot, and 1 part of oil of cloves.

The mixture of the almond oil with the syrupy mass requires some practice, and, particularly towards the end, when the mass becomes stiffer, a considerable expenditure of force.

Almond Soap Cream is prepared by melting 250 parts of pure lard and mixing with the melted fat 100 parts of solution containing 25 per cent. of caustic potash. The latter must be added very slowly, and under constant stirring. When all is added it is gradually allowed to cool, the stirring being continued. It is then transferred to a mortar, and triturated with addition of 6 parts of alcohol and ½ part of oil of bitter almonds, until it is creamy and homogeneous.

Olivine.—4 parts of powdered gum arabic and 12 parts of honey are intimately mixed, and the mixture triturated with 6 parts of Castile soap and with 2 yolks of egg for every ounce of gum arabic used. To this is gradually added, under continued trituration, a previously-prepared mixture of 60 parts of finest olive oil, 2 parts of oil of sesame, 2 parts of oil of bergamot, 2 parts of oil of lemon, 1 of oil of cloves, ⅛ of oil of thyme, and ⅛ of oil of cinnamon, and the whole thoroughly triturated until a homogeneous mass results.

Almond Paste.—16 parts of blanched bitter almonds are rubbed to a fine paste, and this is gradually added to an intimate mixture of 30 parts of honey, 15 parts of yolk of egg, 30 parts of almond oil, ½ part of oil of bergamot, and ½ part of oil of cloves.

Rose Milk (Lait de Rose).—1 part of finely rasped Castile soap is dissolved, with a very gentle heat, in 4 parts of rose-water; 1 part of white wax and 1 part of spermaceti are next added, and, when they are melted, a strained almond mixture is added, prepared from 16 parts of blanched sweet almonds and 1000 parts of water. The addition must be made gradually and under continuous stirring. Finally, 150 parts of alcohol and 8 parts of oil of rose are finally incorporated with the mixture.

Frangipanni Sachet Powder.

Orris root, powdered	1,500 parts.
Vetiver "	120 "
Sandal wood "	120 "
Oil of neroli	2 "
" rose	2 "
" sandal wood.	2 "
Musk bag, powdered	20 "
Civet	5 "

Heliotrope Sachet Powder.

Orris root, powdered	1,000 parts.
Rose leaves, "	500 "
Tonka bean, "	250 "
Vanilla, "	120 "
Musk	4 "
Oil of bitter almond	3 "

TOOTH POWDERS.

(*a*) *Black:*

Wood-charcoal, in fine powder	28 parts.
Oyster-shell, " "	4 "
Orris root, " "	4 "
Catechu, " "	2 "
Cinnamon, " "	2 "
Myrrh, " "	1 part

Another:

Wood-charcoal, in fine powder	4 parts.
Cinchona bark, " "	1 part.
Oil of cloves	q. s.

(*b*) *Red:*

Digest four to five drachms of powdered cochineal with a boiling-hot solution of 90 grains of pure carbonate of potassium in 2 fl. oz. of water; after several days, separate the liquid from the insoluble matter by pressing; triturate the liquid with a mixture of 16 ozs. of powdered oyster-shells, 8 ozs. of powdered cuttle-fish bone, 3 ozs. of powdered orris root, and 150 grains of burnt alum, and finally scent it with equal parts of oil of cloves and of bergamot.

Or scent it with oil of peppermint, of which about 160 minims dissolved in 2 fl. oz. of alcohol may be incorporated with the powder.

Another:

Cinchona, in fine powder	4 parts.
Sandal-wood, in fine powder	8 "
Alum " "	1 part.
Oil of cloves. Oil of bergamot, } equal parts	q. s.

(*c*) *White:*

Cuttle-fish bone, in fine powder	1 part.
Oyster-shell, " "	1 "
Oil of peppermint or oil of sage	q. s.

Bismuthic Hair Dyes—Process of Preparation.—A. Naquet has introduced two new hair dyes, both of which depend upon the formation of sulphide of bismuth from a particularly prepared tartro-bismuthic compound. "The dyes are characterized as perfectly harmless, and as having progressive action, and as producing all the shades from a light flaxen to a deep chestnut color, according to the number of applications made."

The first dye is prepared as follows: Bismuth is dissolved in the smallest possible quantity of nitric acid, and to this is added an aqueous solution of tartaric acid (3 parts of acid to 5 parts of bismuth) and a large quantity of water; the whole is then thrown on a filter and the precipitate washed. The well-washed precipitate, whilst still moist, is dissolved in a boiling solution of bitartrate of sodium (12 to 15 parts of bitartrate to 5 parts of bismuth), then filtered, diluted with water, alcohol, and glycerin, and again filtered. Each liter should contain 150cc. of glycerin, 150cc. of alcohol, and 600cc. of water. The proportion of bismuth present should be 2 grams of metal per 1000, and if the liquor contains less it should be brought to that strength. The paper through which the liquid is filtered will retain some bismuth, precipitated by the alcohol; this can be re-dissolved in nitric acid and again used. The washings from the tartaric precipitate also contain some bismuth, which may be recovered by well-known methods. The hair dye is sent out in two bottles, one containing the above solution, the second containing an aqueous solution of hyposulphite of sodium, made by diluting one part of the cold saturated solution of that salt with 5 parts of water. When required for use, the two solutions are mixed together in equal proportions.

The second dye is prepared in the form of a single solution, the author having found that an ammoniacal solution of the tartro-bismuthic compound will keep indefinitely when mixed with solution of hyposulphite of sodium, if the containing bottle be kept well closed. This mixture deposits the sulphide of bismuth in proportion as it loses ammonia and is acted on by the carbonic acid in the atmosphere. Mr. Naquet gives the following working formula: Dissolve 100 parts of bismuth in the smallest possible quantity of ordinary nitric acid (about 280 parts). To this liquor add a solution of 75 parts of tartaric acid in water, and then a rather considerable quantity of water to insure complete precipitation. The whole is then thrown on a filter, and the residue washed with water until the washings are no longer acid. The magma is placed in a dish, and solution of ammonia gradually stirred in until all is dissolved: 0.8 to 0.9 litres being required for 1½ kilogram of bismuth used. To this liquor 75 parts of hyposulphite of soda in powder is added, and when the salt is dissolved the product is filtered and put into bottles. It is of advantage to add 1 or 2 per cent. of glycerin, but the addition of alcohol is not necessary. The liquor contains about 5 per cent. of bismuth. When the liquid has been applied to the hair, it assumes after five or six hours a deep chestnut color, which is reduced to a delicate flaxen hue upon washing; but after each day's application the depth of color is increased until finally a deep chestnut color remains persistent.—Phar. Jour. Trans., Sep. 16, 1882, 222–223, from Monit. Scientifique (3), xii. 880.

Vanadium Ink—New Formula.—Vanadium tannate was proposed for use as writing ink by Berzelius, because the writing is not affected by acids; but the high price of vanadium salts was a great obstacle to its introduction. Since these salts have been more largely prepared for use in the manufacture of anilin black and other dyes, vanadium ink is again proposed. Dr. Siemens gives the following formula: Tannin 10 gm.; ammonium vanadate, 0.2 gm.; water, 200 gm.; and gum arabic, 6 gm. Bœttger proposed pyrogallic acid and ammonium vanadate, which yields a blue-black liquid free from any precipitate, as a good ink; however, Dr. E. Geissler found the writing with this ink to change to yellowish brown in a short time. Extract of logwood and ammonium vanadate yield likewise an excellent ink.—Amer. Jou. Phar., May 1883, 274, from Phar. Centralh., 1883, p. 148.

Invisible Ink—New Formula.—C. Wideman communicates a new method of making an invisible ink to *Die Natur*. To make the writing or drawing appear which has been made upon paper with the ink, it is sufficient to dip it into water. On drying, the traces disappear again, and reappear by each succeeding immersion. The ink is made by intimately mixing

Linseed oil	1 part.
Water of ammonia	20 parts.
Water	100 "

The mixture must be agitated each time before the pen is dipped into it, as a little of the oil may separate and float on top, which would, of course, leave an oily stain upon the paper.—New Rem., Feb. 1883, 55.

Black Ink for Rubber Stamps is prepared according to "Neuste Erf. & Erf.," as follows:

Aniline black	½ oz.
Pure alcohol,	
Concentrated glycerin, of each	15 oz.

Dissolve the aniline black in alcohol, and add the glycerin.—New Rem., Mar. 1883, 79.

Shoe-blacking.—Mix rapeseed oil, 1 liter, with syrup 2.5 kilos, water, 5 kilos, and ivory-black, 5 kilos; then add slowly, stirring constantly, sulphuric acid, 2.5 kilos, when the mixture becomes hot and thick; finally, stir in water, 2.5 kilos.

Another formula is as follows: Mix intimately fine ivory-black, 6 parts; syrup, 28 parts; sugar, 4 parts; fish oil, 3 parts; and sulphuric acid, 1 part; set aside for 8 hours and stir into the mixture decoction of tan, 4 parts; ivory-black, 18 parts, and sulphuric acid, 3 parts, when the mass may be poured into boxes.

Shoe-blacking free from sulphuric acid is made as follows: Boil extract of logwood, 1 part, and bruised nut-galls, 30 parts, with 25 times their weight of strong vinegar; express the liquid, add copperas, 8 parts, and set aside for twenty-four hours; decant the clear liquid and add gum-arabic, 8 parts; rock candy, 100 parts, and syrup, 80 parts; strain and mix with alcohol, 50 parts; solution of shellac, 40 parts, and finally, powdered indigo, 40 parts.—Zeitschr. Œster. Apoth. Ver., 1882, p. 435; from Polyt. Notizbl., in Amer. Jour. Phar., Feb. 1883, 103.

Rubber Lubricator for Belts.—5 parts of India rubber are cut fine and melted together with 5 parts of oil of turpentine in an iron, well-covered vessel; then add 4 parts of rosin, stir well, melt and add 4 parts of yellow wax, stirring constantly while melting. This mixture while warm is added, with constant stirring, to a melted mixture of 15 parts of fish oil and 5 parts of tallow, and the whole is agitated until it has congealed. The mass is applied to old belts upon both sides in a warm place, and when the belts are in use, from time to time upon the inner side. By this treatment they become very durable.—Amer. Jour. Phar., Feb. 1883, 103, from Chem. Centralblatt, 1882, p. 768.

Fat-Stains—Removal from Paper, etc.—Oil or fat-stains, even when old, may be removed from paper or similar fabrics by means of a mixture of benzol and magnesia. Calcined magnesia is mixed with a sufficient quantity of benzol to produce a mass which becomes granular after a while. A little of this mixture is rubbed with the finger upon the stain, and the little granules of magnesia afterwards wiped off. Fresh stains usually disappear entirely, old ones after a short time, particularly if the treatment is repeated two or three times. A great advantage of this method, originally introduced by Hirzel, is this, that it may be used upon the finest kind of paper and that it scarcely affects printed paper; prolonged contact only rendering the printing paler.

The mixture should be preserved in well-closed glass-stoppered vials.—New Rem., June 1883, 178, from Neueste Erfind. und Erfahr.

Cleaning Brass—Method in Use at the U. S. Arsenals.—According to "New Remedies" (Oct. 1882, 305), the government method prescribed for cleaning brass, and in use at the United States arsenals, is claimed to be the best in the world. The plan is to make a mixture of two parts of common nitric acid and one part of sulphuric acid, in a stone jar, having also ready a pail of fresh water and a box of sawdust. The articles to be treated are dipped into the acid, then removed into the water, and finally rubbed with sawdust. This immediately changes them to a brilliant color. If the brass has become greasy, it is first dipped in a strong solution of potash and soda in warm water.

Potato Ivory—A New Substitute for Ivory.—It is stated in "Monthly Magazine," that a new vegetable ivory is being made from ordinary potatoes by a method which is carefully withheld, and which is purely chemical. It appears, however, that sufficient has leaked out to warrant the statement that the change is effected upon the scrupulously pared and cleaned potatoes by the action of sulphuric acid; the strength of acid, time of treatment, and temperature, are not known. The new substance is not unlike ordinary vegetable ivory, but is said to be of a more even "grain," as well as easier to turn, while it is not liable to split when exposed to the influence of a very dry atmosphere. It is creamy white—but may be colored, during the process of preparation or subsequently, to any desired tint—hard, durable, and elastic, and is even adapted to the manufacture of billiard balls.—New Rem., Mar. 1883, 76.

Artificial Amber—Characters of Distinction from True Amber.—Artificial amber, closely resembling the natural product, is made chiefly from colophony; it softens at a much lower temperature, and becomes at once opaque and gradually soft in alcohol. True amber melts between 285° and 287°C.; alcohol acts scarcely upon it, and fragments of it are united to larger pieces by moistening the surfaces with potassa and pressing them together.—Amer. Jour. Phar., Sept. 1882, p. 459, from Polyt. Notizbl.

MATERIA MEDICA.

A. Vegetable Drugs.

GENERAL SUBJECTS.

New Brazilian Drugs.—Mr. Charles Symes draws attention to the following Brazilian drugs:

Resin de Angico.—This is a product of the district of Maranham, and is not a resin but a gum, of a deep brownish red color, translucent, and breaking with a shining fracture. It occurs in pieces of from 1 to 3 ounces in weight, some of which have portions of bark attached to them. In the "Formulario on Gui Medica," of Chirnoviz, it is mentioned as the product of *Acacia Angico*, and is said to be good for chest complaints; the same tree yielding an astringent bark. The pieces are very tough, but lose 12 per cent., of moisture on drying at 212° F, and may then be readily powdered. With twice its weight of water the gum forms a thick magma; less than one-half dissolves when eight parts of water are used, (the solution having a slight acid reaction) and the remainder on the addition of a little caustic alkali. It dissolves in proof spirit almost as completely as it does in water, but its aqueous solution is rendered turbid by excess of rectified spirit, and by oxalate of ammonia. On the other hand, it is not affected by solutions of perchloride of iron, borax, or acetate of lead.

The same district furnishes a substance named

Almasca.—This was received in sausage-shaped masses of about 12 inches in length and 2 to 3 inches in diameter, and covered with dried leaves. It is evidently a species of *elemi*, with which it agrees in its solubility, etc.; but it differs in appearance and some of its characters from the elemi of commerce, from the Brazilian elemi of the Hamburg collection, and also from that of Dr. Pareira at Bloomsbury Square. Except that it is more recent, and therefore much softer, it more nearly resembles the Brazilian elemi of Martin's collection; and Mr. Holmes is of the opinion that it is produced by the same species, probably by *Icica heptophylla*. No particulars of its use are given.

A third drug, called

Guassatunga, was obtained from the neighborhood of Porto Alagse, in Southern Brazil, where Mr. Joseph Hallowell found an alcoholic tincture of the drug, of golden-yellow color, to be a popular native remedy for snake-bite. It is the bark of a tree inhabiting the border of Uruguay, and occurs in pieces of from 2 to 4 inches in length, from 1 to 2 inches in width, and $\frac{1}{16}$ in thickness, hard and breaking with a short, non-fibrous fracture. It is of a fawn-color, with a greenish-brown tint diffused irregularly over it, paler on the outer than on the inner surface, and possesses a slightly bitter taste. Experiments made by Mr. Symes show it to contain a crystalline alkaloid.—Yearbook of Pharm., 1882, 429–432.

Madagascar Drugs—Description.—Some years ago (Phar Jour. Trans. (3), Vol. XI., p. 853), Mr. E. M. Holmes called attention to a list of remedies used in Madagascar, and made some remark concerning their uses. These remedies embrace roots, barks, woods, etc.; and while a considerable number may not possess active properties, others probably possess properties which may justify their use. He, therefore, now gives a brief description of the specimens in his possession, so that they may be distinguished from other drugs. Some of the drugs have been identified with drugs of known activity.—See Phar. Jour. Trans., Aug. 12, 1882, 121–123.

Medicinal Plants from Ceylon.—Surgeon W. C. Ondaatje draws attention to some medicinal plants of Ceylon, which he considers may replace some of the more expensive drugs now in use in Ceylon. The drugs embrace certain parts of the following plants: *Randia dumetorum*, Lam., *Sethia acuminata*, Arn., *Coscinium fenestratum*, Colebr., *Vateria Indica*, L., *Semecarpus Gardneri*, Thw., *Vernonia anthelmintica*, Willd., *Alstonia scholaris*, R. Br., and *Acorus Calamus*, Linn., the remarks upon which have been abstracted to the extent of their importance under their several headings.—See also Phar. Jour. Trans., April 7, 1883, 818–819.

New Zealand Drugs—Collection of Gums, etc.—Mr. Thomas Kirk, F. L. S., a New Zealand botanist of note, recommends to the notice of colonists in that island the Tragacanth shrub (*Astragalus spec.*) which grows freely in Asia Minor, Armenia, and Persia, and in Northern Syria, at an altitude of five thousand feet, and from whose sap the useful gum known as gum tragacanth is derived. Although not so valuable a product as gum arabic, not being applicable to so many purposes, this gum, nevertheless, forms an important item in the commerce of the Levant, the town of Smyrna alone exporting annually more than £70,000 worth. From the similarity in climate between the colony and the natural habitat of the plant, Mr. Kirk is convinced that the culture of the plant might very successfully and very profitably be taken up in New Zealand, where the collection of its gum would soon rank as an important item among other pursuits of a similar nature. Another gummiferous plant, which has lately attracted much attention in Australia, and which might probably be introduced into other colonies, is the *Eucalyptus resinifera*, usually called the red-gum tree, which yields a volatile, aromatic gum from both its leaves and its trunk. This gum is stated by experts to be almost identical with the better known gum kino, a valuable drug as well as a useful dye, obtained principally from the East Indies, where it is obtained by tapping the trunks of *Pterocarpus Marsupium*, Roxb. When the bark of the red gum is wounded in a proper manner, as much as sixty gallons of sap, equal to five hundred pounds' weight of the drug, may flow from a single tree. Another candidate for tropical colonial culture is the great conifer which yields gum dammar, long a speciality of the Moluccas. The celebrated Kauri pine of New Zealand (*Dammara australis*) is a member of the same family, with the advantage that, though it grows in a temperate climate, it yields a valuable gum of a similar nature. The yield of sap in the species generally is indeed most abundant; so profuse, indeed, that in some of the gigantic Molucca specimens it exudes spontaneously. The Kauri gum of Auckland, of which such considerable quantities are shipped, is the hardened and semi-fossilized exudation of ancient Kauri trees which ages ago ceased to exist, and whose imperishable product is found below the surface of the ground. This unique industry is, of course, dependent on the exhaustion of the stock of buried gum, and it ought to be supplemented by the careful extraction of gum from the living trees. Properly carried out, this extraction of gum may be a perennial source of profit, while, on the other hand, the improper tapping of the trees may result, as it has too often already, in the destruction of the source of supply.—New Rem., May 1883, 135, from The Colonies of India, and The Chem. Jour.

Herbarium Specimens—Directions for Drying.—Mr. Leo. H. Grindon gives, in the Field Naturalist, the following very simple and somewhat novel method for securing perfect herbarium specimens of plants which are usually difficult to preserve in a condition of any value, even with the expenditure of much time and patient labor. Obtain a half-dozen pieces of stout mill-board, cut to about 12x18 inches. Then gather about a hundred old newspapers, and fold them neatly to about the dimensions of the mill-boards. Four or five yards of common white cotton wadding, a score of sheets of tissue paper, and as many of blotting paper, all cut to the same size, complete the apparatus. One of the boards serves as a foundation; on this place a newspaper, then a piece of wadding, and upon this place the specimen intended to be dried. The cotton being soft and retentive, every portion can be laid in a proper and natural way, including the petals of flowers. A newspaper above—two or three if the specimens have thick stems—and so on, until all the specimens have been similarly deposited. If the specimens are sticky, or haïry, or of a kind that the wadding seems likely to adhere to, then, before depositing them on it, introduce a half sheet of tissue paper. A heavy weight must be placed on the top of all, sufficient to imbed the specimens in the wadding; then leave the whole to rest for twenty-four hours. All the papers must then be changed, dry ones being put in their places; and if the plant seems to throw off a very considerable amount of moisture, such as will render the wadding quite damp, change the wadding also. A second or even a third change is desirable at the end of two or three days, or a week, and when this is made, introduce the blotting-paper, pressing again till everything is perfectly flat, and the specimens are absolutely dry. The writer says that, when thus dried, every petal and leaflet retains the form it had in life, and nine specimens out of ten preserve their color exactly. To insure the keeping of color, it is well, if time can be spared, to change the blotting-paper many times, and to dry it thoroughly before a fire; this, however, need not be done until after the third day.—New Rem., March 1883, 74.

Astringent Drugs—Percentage of Tannin in Different Sorts.—Chas. F. Kramer has determined the percentage of tannin in different drugs with the results below given:

Brayera	24.40	Hæmatoxylon	3.50
Caryophyllus	13.00	Heuchera	20.00
Catechu	40.33	Humulus	4.00
Chimaphila	4.00	Krameria	22.00
Cinnamomum	9.36	Pimenta	1.69
Cornus florida	3.00	Prunus Virginiana	3.42
Galla	66.88	Quercus alba	8.34
Geranium	17.33	Rubus	10.20
Geum	3.00	Sassafras	6.00
Granati Fructus Cortex	28.00	Tormentilla	17.00
Granati Radicis Cortex	22.00	Valeriana	1.54

—Am. Jour. Pharm., Aug. 1882, 388.

COMMERCIAL QUALITY.

Powdered Drugs.—C. L. Becker has examined microscopically forty-two powdered drugs obtained from a retail drug store, and found thirty to be pure. The nature of the supposed adulteration is not stated, or was not determined, in powdered asafetida, cloves, jalap, and rhubarb. Starch was found in cinnamon; wheat flour in elm bark, mustard (with turmeric), mandrake, poplar bark, and valerian; corn meal in fenugreek, and an inferior gum with crystals of silica in gamboge.—Am. Jour. Phar., June 1883, 302, from the Microscope, February, 1883, p. 189.

Amcher—A New Anti-scorbutic.—Dr. Clarke speaks highly of "amcher," a new anti-scorbutic which is being introduced among the native soldiers in India, and promises to be an excellent substitute for lime juice. It is made from green mangoes, which are skinned, stoned, cut into pieces, and dried in the sun.

Catha Edulis—An Arabian Substitute for Tea.—The "Indian Agriculturist" gives an account of this plant, known as *Khat*, *Cafta*, or *Arabian Tea*, which is of much importance to the Arabs, since it furnishes them tea. The plant is shrubby, growing about ten feet high, with smooth, elliptical, serrate leaves, two or more inches long, and about an inch wide. They are peculiar in being arranged on some branches opposite and on others alternate. The flowers are small and white. The plant is largely cultivated in the interior of Arabia, mostly in gardens along with coffee. For the purposes of commerce, the twigs, with the leaves attached, are carefully dried, and made up into closely-pressed bundles of different sizes, the quality being known by the form and size of the bundles, the best of which are about a foot or fifteen inches long and three inches wide. The use of this tea is said to antedate that of coffee, and the effects of its use are described as similar to those of strong Chinese green tea. About three hundred camel-loads are brought into Aden in the course of a year.—Phar. Jour. Trans., April 14, 1883, 840.

Dammara Australis—Collection of Gum in New Zealand.—See "New Zealand Drugs."

ALGÆ.

Sea Weeds.—Utilization for the production of a new gum-like substance, ***algin***, which see under "Organic Chemistry."

FUNGI.

Microscopic Organisms—Formation in Certain Saline Solutions.—Mr. C. H. Bothamley, having been troubled with the formation of green vegetable growth in bottles containing solutions of phosphate of sodium, of sulphate of magnesium, and of sulphate of calcium, has made some experiments with a view to determining the source. Ten per cent. solutions of sulphate of magnesium and of phosphate of sodium were prepared, and portions of these solutions were placed in small flasks, as follows:

(*a*) Original solution, left exposed to air.
(*b*) Solution boiled five minutes, then left exposed.
(*c*) Solution boiled five minutes, and flask plugged with cotton wool.
(*d*) Solution heated at 55°–60° C. for two hours, then plugged.
(*e*) Solution heated at 70°–75° C. for two hours, then plugged.

After some time the vegetable growth commenced to form, and gradually increased in the flasks *a* and *b;* but no growths appeared in the plugged flasks (*c*, *d* and *e*), even after fifteen months. It is evident, therefore, that the germs of the vegetable organisms are derived from the air. A microscopic examination leads the author to the conclusion that these organisms belong to the somewhat indeterminate group of bodies which are classed together as *crococcus*. It should be remarked that these growths were not observed in solutions of ammonium salts, barium chloride, and other reagents, and the author appears to regard the presence of phosphoric acid (present in the sulphates above named as impurity) necessary to the development of the organisms—Yearbook of Pharm., 1882, 479–481.

Ergot—Galenical Preparations.—Mr. C. S. Hallberg communicates the results of experiments with diffused preparations of ergot—*powder*, *fluid extract*, *fluid ergot* (so called) *sclerotic acid*, etc.—and recommends for all of these preparations the careful extraction of the fixed oil from the drug by percolation with deodorized benzin, and of the black resinous extractive—regarded by Hager to be inert—by percolation with strong alcohol. Mr. Hallberg examined both the oil and alcoholic extractive, and concluded that they are devoid of the physiological action for which ergot is valued.

Purified Powdered Ergot, prepared in this way, has greater stability than the ordinary powder, is devoid of the poisonous principle, and is the most suitable for making the different galenical preparations of ergot. —Amer. Jour, Phar., Jan. 1883, 8–15.

Mushrooms—Poisonous Characters of the Edible or Common Kinds.—Prof. Roufick, of Breslau, has lately made experiments on the common mushroom, of which the following, published in the "British Medical Journal," are the results: All common mushrooms are poisonous, but cooking deprives them, more or less, of their poisonous qualities. The repeated washing with cold water which they usually undergo to clean them takes away a portion of the poison, and boiling does the rest; but the water in which they have been boiled is highly poisonous, and should be carefully gotten rid of. Experiments made on dogs showed that if a dog ate one per cent. of its own weight of raw mushrooms it fell sick, but recovered; if it ate one and a half per cent. the poison had a more violent but not fatal effect; and if it ate two per cent. it was inevitably fatal. The water in which mushrooms had been boiled was far more poisonous than even the raw mushrooms, while the mushrooms thus boiled could be taken without hurt to the amount of ten per cent. of the weight of the dog's body. Washing with cold water does not remove all the poison, so that mushrooms thus prepared are poisonous when taken in larger quantities. Dried mushrooms are still dangerous for from twelve to twenty days, and also the water in which they have been boiled. They require to be dried for at least a whole month, and are only really safe after four months' drying.—Amer. Jour. Phar., Dec. 1882, 631, from Chic. Med. Review, Oct. 1.

Polyporus Officinalis—Use in Sweating of Phthisis.—Dr. Murrell gives an account of the action of white agaric (*Polyporus officinalis*) in the sweating of phthisis. After numerous experiments, he has arrived at the conclusion that it is a good remedy, and that there are times when it may be used with advantage; but he much doubts if it is equal to atropia, picrotoxin, pilocarpine, or Dover's powder. In small doses it is uncertain in its action, whilst in larger doses it purges violently. The agaric was given in doses of three grains up to thirty. The drug in three-grain doses acted slowly, and not with certainty, three grains of extract, equal to nine grains of the powder, acting better, whilst thirty grains purged violently. A tincture of 1 in 6 and a fluid extract 1 in 3 have also been prepared. The active principle, agaricine, has been given in the dose of

$\frac{1}{12}$ of a grain, and was found to check cough and to promote sleep, as well as to restrain sweating.—New Rem., Feb. 1883, 42, from "Practitioner," through Pharmaceutical Journal.

Agaricus Ruber, Pers.—*Proximate Constituents.*—This fungus contains, according to T. L. Phipson, a rose-red coloring matter, ruberin, which appears bright blue by transmitted light; being soluble in water, it is washed out of the head of the fungus by a heavy fall of rain. Ether extracts from the fungus a yellowish-white alkaloid agarythrine, which has a bitter, afterwards burning taste, somewhat like aconitine; its chloride is soluble, but the sulphate insoluble in water, the latter dissolving in alcohol; it dissolves in nitric acid with a red color, and is colored red by chlorinated lime and afterwards bleached. On agitating the solution of the alkaloid with ether, it is oxidized by the air to a red coloring matter, which is probably the cause of the red color of the surface of the fungus.—Amer. Jour. Phar., Feb. 1883, 97, from Chem. News, 1882, p. 199.

Agaricus—Use in the Treatment of Night-Sweating.—Dr. Wolfenden finds that atropia yields excellent results when given in does of $\frac{1}{70}$ of a grain. It is, however, a dangerous drug to use, on account of its poisonous properties. Dr. Wolfenden, therefore, prefers to employ agaricus, which is of equal value to atropia, while it is quite harmless, since ten grains too much or too little produce no toxic effects. Agaricus is a light, bulky, brown powder, of very bitter taste, and is best administered in the form of a confection, with a little jam. Twenty grains are usually quite sufficient, given at bedtime, though thirty grains may be necessary to check the sweating completely, the only inconvenience attending the administration of large doses being the great quantity of the powder. Patients, however, make no objection to the bitter taste, etc., when they find how much benefit they receive from its use. Dr. Wolfenden has administered it in nearly forty cases of phthisis with complete success. The only ill effects which have been noticed are, first, sickness, which stops on elimination of the dose; secondly, diarrhœa, which can be averted by combination with one or two grains of Dover's powder.—Glasgow Med. Journal.

Dr. Young uses a tincture and a crystalline principle obtained from agaricus. He confirms the above statements, and finds in addition that cough is relieved, sleep induced, and temperature lowered by the drug.—Am. Jour. Pharm., Aug. 1882, 427, from Med. Times and Gazette; Louisv. Med. News, May 27.

Lycoperdon Giganteum—Uses as a Local Hæmostatic.—Mr. Wm. Elborne draws attention to this fungus—the giant puff-ball. All the various species of lycoperdon are produced abundantly in nearly every country, but are so variable both in character and properties, that it is very difficult to distinguish them. Dr. E. Thompson recalls attention in the "Lancet" to the use of this fungus as a local hæmostatic. He states that it forms a very soft and comfortable surgical dressing, and that the powder it contains seems to contain antiseptic and anodyne properties. The mature plant is about the size of a child's head, and is covered with a thin skin; the latter is removed, and capillitium and spores which form a dusty mass are used. Mr. Fagan, a leading surgeon of Belfast, found that it at once restrained the bleeding from arteries in the bone, in the neighborhood of the orbit, after the failure of other means. The researches of Hagan show that the hæmostatic action of the puff-ball, as well as of all other spongy or powdery substances, depends upon the fact that healthy blood deposits hæmato-blasts or minute corpuscles, on any foreign substances introduced into a vein, which become adhesive points for she subsequent attachment of particles of fibrin. This action, however, also takes place when the vessels themselves assume abnormal conditions, as when cut or altered by disease.—Amer. Jour. Phar., June 1883, 325, from Phar. Jour. and Trans., Feb. 24, 1883, 688.

The fumes produced by the burning of this fungus have been used for stupefying bees and other insects, and for the anæsthesia of other animals, effects which are due to the presence in the fumes of carbonic oxide.—Amer. Jour. Phar., June 1883, 326.

LICHENES.

Stereocaulon Vesuvianum—Chemical Constituents.—Mr. M. Coppola examined this lichen some time ago, and found in it *succinic acid*, whilst Paterno, by treating it with ether, obtained *atranoric acid*. In order to explain this apparent discrepancy, Mr. Coppola has now again taken up the investigation, and, by treatment with ether, he also obtained atranoric acid, whilst from the residue he obtained, on treatment with milk of lime, succinic acid.—Jour. Chem. Soc., Aug. 1882, 867, from Gazetta Ital., 12, 19–27.

FILICES.

Adiantum Capillus Veneris, Linn.—*Uses in Greece.*—Prof. X. Landerer observes that the maidenhair is known in Oriental countries as *polytrichi*, and is highly valued for promoting menstruation, and in nearly all diseases of women. The name Adiantum is derived from a, not, and *diaino*, to moisten, the plant growing on rocks in moist localities and brooks without being wetted, the water not adhering. It was formerly also called *polytrichon* and *kalliphyllon*.

AROIDACEÆ.

Acorus Calamus, Linn.—*Anthelmintic Properties.*—Dr. W. C. Ondaatje states that an infusion of the rhizome or rootstock of the sweet flag is given to young children in Ceylon as an anthelmintic, and that he has known it to be so used very effectually in many cases.—Phar. Jour. Trans., April 1883, 819.

GRAMINACEÆ.

Triticum Pratense—Constituents.—Fred. Grazer examined the flower heads of red clover and found 2 resins, fat, chlorophyll, glucose, tannin, gum, an acid principle, and extractive matter; the resin, soluble in ether, dissolved in ammonia with a green color, and in potassa with a yellow color. The ash amounted to 7½ per cent., and consisted of carbonates and phosphates of magnesium, potassium, and calcium, and of oxide of iron.—Amer. Jour. Phar., April 1883, 194, from Proc. Cal. Phar. Soc., 1883, p. 49.

PALMACEÆ.

Vateria Indica, L.—*Uses as an Anti-Ferment.*—Dr. W. C. Ondaatje states that the bark of this plant is in daily use by the natives of Ceylon to arrest the alcoholic fermentation of the juice of the Jaggery palm, *Caryota urens*, a favorite beverage. This property, the author thinks, might be turned to account in some of the manufacturing interests, if not in medicine.—Phar. Jour. Trans., April 7, 1883, 818.

SMILACEÆ.

Convallaria Majalis—Doubtful Value.—*Convallaria majalis* has recently been recommended (see Proceedings, 1882, 149) as a substitute for digitalis in regulating the frequency and rhythm of the heart-beats, increasing the strength of the contractions, and raising the blood pressure, and as being free from the cumulative action of digitalis. Dr. B. Stiller has used the drug in twenty-one cases, of which seventeen gave absolutely negative results, showing not the least influence on the frequency or rhythm of the heart's action; two individuals experienced a certain degree of diuretic effect without any of the other vaunted phenomena, not even the dropsy being diminished; only two patients underwent decided improvement in most of the cardiac symptoms during the use of the new medicine; but these cannot outweigh the large balance of negative results.—Amer. Jour. Pharm., April 1883, 199, from Boston Med. and Surg. Jour., Feb. 22, 1883; Wiener Med. Woch.

Convallaria Majalis—Therapeutic Value.—Professor Beverly Robinson having during the past three months used *Convallaria majalis* (lily of the valley) in a number of cases of chronic cardiac disease, reports that in cases having dyspnœa, oppression, localized pain, palpitation, doses of five to ten drops every three hours of the fluid extract notably diminish these phenomena. The physical signs are also lessened in degree. Thus the pulse becomes stronger and more regular, the heart-sounds acquire additional force, and the painful palpitations disappear, dyspnœa is often favorably modified, and the respirations become slower and deeper. Anasarca is not much influenced by it, the urine scarcely, if at all, increased, nor its solid constituents manifestly modified. It is well borne by the stomach. Prof. R. believes that the drug exerts its influence through the pneumogastric nerve rather than upon the cardiac muscle. It does not restore rhythmic heart-action to the same degree as digitalis, nor does he think it equals the latter in increasing cardiac contractility. Its *one* advantage over digitalis seems to be the absence of cumulative effects. It is greatly inferior to caffeine as a diuretic, though superior to it as a cardiac invigorator, and less variable in its action.—New Rem., Mar. 1883, 89, from N. Y. Med. Jour.

Convallaria Majalis—Physiological Action.—Dr. E. C. Trudeau communicates his experience with the use of *Convallaria majalis* for a year past, and expresses his belief that it is most successful in all cases, where to restore the balance of the *right* side of the heart is imperative, while it is much less active when increased energy on the part of the left ventricle is called for. Its striking power in controlling dyspnœa in cases of emphysema, fibrous, and chronic phthisis (cases in which digitalis frequently fails), in relieving the orthopnœa of mitral disease, increasing, at the same time, the flow of urine, and its failure to mitigate the symptoms of aortic mischief or to increase of flow of urine in such cases, are clinical facts which tend to confirm this suggestion. It is in relieving dyspnœa that *Convallaria* attains its most brilliant results, while it has only an uncertain and trifling power over œdema and dropsy, and it succeeds often in precisely the cases in which digitalis fails. Another indication for its use, not hitherto dwelt upon, is in controlling the symptoms of purely functional heart disorder.

Paroxysmal palpitation and dyspnœa due to nervous causes, rapid and irregular heart-action dependent upon debility, are symptoms almost always benefited by it, and which often entirely disappear during its exhibition.—New Rem., May 1883, 142, from Med. Record.

Convallaria Majalis—Medicinal Exhibition.—A. Langlebert has made different preparations, such as alcoholates, tinctures, infusions, alcoholic, hydroalcoholic, and aqueous extracts, from the entire plant, the flower, the stalk, the leaves, and the root, which have been subjected to physiological experiments by Professor Sée. The results have shown that each part of the plant employed produces a slightly varied effect, and that the best effects are obtained with an *aqueous extract* prepared from the flower and stalk of the *Convallaria Majalis*, with the addition of a third of their weight of roots and leaves. This extract, deprived in great part of the resinous purgative principle, is solid in consistence, shining black, possesses a very bitter taste, is soluble in all proportions of water and alcohol, and has an agreeable, persistent odor. It is used in the preparation of an aromatized syrup, having a free bitterness, without after-taste, and containing 50 centigrams of extract to a tablespoonful. It is under this form, and in doses of 2, 3 or 4 spoonfuls, that the medicament is prescribed in the treatment of cardiac affections.—Phar. Jour. Trans., Aug. 19, 1882, 143, from L'Union Pharm. xxiii., 338.

A paper on the physiological action of *Convallaria Majalis* has also been contributed by Professor G. Sée. He finds that: 1. The aqueous extract of the leaves requires a dose three times as large as the extracts from other parts of the plant; 2. Extracts of the flowers exercise upon animals a very energetic action, and upon man a much less intense one; 3. Extracts of the entire plant, including flowers, stalks and root, are the most active. By an approximate calculation, based upon corporeal weight, the dose useful in cardiac disease was determined, and is thus formulated by the author: 1 gram to 1½ and even 2 grams of the extract of the flowers or of the entire plant; extract of the leaves is only active with double the dose.—Ibid., p. 144, from Ibid.

Convallaria Majalis—History, etc.—Mr. H. G. Greenish gives a very interesting review of the history of this drug, which, though new in respect to its application in modern medicine, is in reality a very old remedy. The author has evidently studied the history of the drug very thoroughly, and his concluding remarks may, therefore, serve to enlighten those who are in search of something tangible regarding the part of the plant to be used, and the dose. He says: "The pharmacist that is desirous of adding a preparation of convallaria to his stock of drugs may well be at a loss to know which part of the plant to select. Shall he, with Dr. Alfayef, make a tincture of the flowers, 1 in 4? or follow Professor Sée's advice, and having mixed flowers, leaves, and stalks in certain proportions for reasons he is unable to fathom, proceed to make from them an extract? Or again, shall he act upon Tanret's suggestion and prepare the active principle in a state of approximate purity? From the literature on this subject no satisfactory answer is obtained; but is it not probable that any part of the plant, flowers, leaves, or roots, that contains the convallamarin may be used, that the average dose will vary directly with the amount of that principle present, and that in each individual case a series of experiments must be made to determine the individual dose?"—Pharm. Jour. and Trans., June 23, 1883, 1058–1059.

LILIACEÆ.

Jafferabad Aloes—Crystalline Constituent.—Mr. W. A. Shenstone has separated the crystalline constituent of Jafferabad Aloes (see Proceedings 1881, 124), finding Histed's method the most suitable. One and a half pounds of the powdered substance was treated with enough proof spirit to make a thin paste, and after standing a few hours was enveloped in folds of stout calico, and submitted to powerful pressure, by which means a yield of about 28% of crude aloin was obtained. The crude aloin was purified by twice crystallizing from water, then by crystallizing several times from dilute spirit, and finally by crystallizing twice or thrice from rectified spirit. Combustion proved the product to be evidently in a pure state. The numbers agree very closely with the formula $C_{16}H_{18}O_7$, which Dr. Tilden (see Proceedings 1876, 379) found to be correct for barbaloin and zanaloin in their anhydrous condition, and also with the formula for nataloin, except that the carbon is somewhat higher. The water of crystallization was found to be 16%, and is somewhat high, Dr. Tilden having found 14% in zanaloin. The crystalline form of the aloin from Jafferabad aloes is not distinguishable from that of zanaloin, as will be seen by the accompanying cuts (Figs. 23, 24, and 25). Two photographs were taken of the new aloin, shown by No. 23 and No. 24, whilst No. 25 shows the zanaloin of Dr. Tilden's preparation.

FIG. 23.

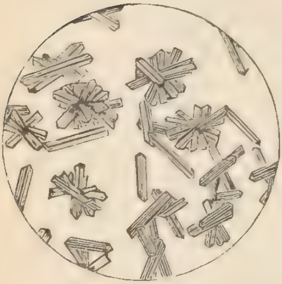
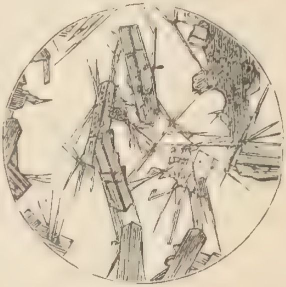
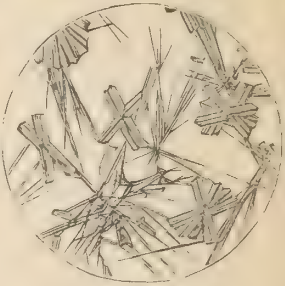


FIG. 24.



Crystals of Jaffaloin.

FIG. 25.



Crystals of Zanaloin.

As the adoption of a new name for every fresh variety of aloin examined is likely to be a source of some inconvenience, and as there is an obvious advantage in adopting a nomenclature which will group together those aloins which are most nearly alike, and also because the aloins seem likely to fall into a few groups, the author suggests that zanaloin, socaloin, and Jafferabad aloin be classed with barbaloin, distinguishing the aloin of Barbadoes aloes, which differs in a few particulars from the others, as α-barbaloin, and the later discovered aloins, between which no distinct differences are known, as β-barbaloin. Nataloin, however, differs so distinctly from the rest, that it will be convenient to retain that name for that substance. The main points of difference among these bodies could then be tabulated thus:—

1. Nataloin, obtained from Natal aloes, yields only picric and oxalic acids by treatment with nitric acid. Is not reddened, even on heating, by that reagent.

2. Barbaloins yield chrysammic, aloetic, picric, and oxalic acids by treatment with nitric acid.

They may be divided into—

a. α-barbaloin, obtained from Barbadoes aloes. Is reddened in the cold by ordinary strong nitric acid.

b. β-barbaloin, obtained from Socotrine, Zanzibar, and Jafferabad aloes. It is not colored by cold nitric acid, but gives an orange-red coloration when heated with it, and also gives a coloration in the cold with fuming nitric acid.—Amer. Jour. Phar., Feb. 1883, 92–95.

Aloes.—Influence of Heat in the formation of Inert Resin during the preparation of the *extract,* which see under "Pharmacy."

IRIDACEÆ.

Saffron—New Adulteration.—A new adulteration is described by Dr. J. Biel in "Phar. Zeitschr. f. Russland." It consists of calendula florets dyed with dinitrocresolate of sodium, then impregnated with oil, and rolled up lengthwise. It is mixed with from 4 to 30 per cent. of true saffron, and was offered as Alicante saffron. The factitious article closely resembles disconnected styles of crocus, except that it is of uniform thickness, and is never attached to a yellow filiform style. It tinges water yellow like saffron, yields about the same amount of ash (9 against 8 per cent. for saffron), but imparts to petroleum-bezin a lemon-yellow color, while the coloring matter of saffron is not soluble in that liquid. Sodium dinitrocresolate, being cheap and innocuous, has been in use for some time for coloring liquors.—Amer. Jour. Phar., April 1883, 177.

MUSACEÆ.

Bananas—Chemical Composition of the Ripe and Unripe Fruit.—According to L. Ricciardi, the green banana contains a large amount of starch, about 1/8 of its weight, which disappears in the ripe fruit. When the fruits are left to ripen on the trees, nearly all the sugar formed is cane sugar, whilst the sugar contained in the fruits taken from the trees in a green state, and allowed to ripen afterwards, is composed of ⅘ of interverted sugar, and ⅕ of cane sugar. The tannic substances and the organic acids of the green fruits disappear when the bananas are ripe.

The composition of the ripe and unripe fruit is shown in the following:

	Ripe.	*Unripe.*
Water	66.78	7.92
Cellulose	0.17	0.36
Starch	traces	12.06
Tannic substances	0.34	6.53
Fatty substances	0.58	0.21
Interverted sugar	20.07	0.08
Cane sugar	4.50	1.34
Proteic substances	4.92	3.04
Not determined	1.69	4.42
Ashes	0.95	1.04

The ashes of bananas are very rich in phosphoric acid (23.18 per cent.) and potassium oxide (45.23 per cent.)—Am. Jour. Phar., Jan. 1883, 49, from Jour. Amer. Chem. Soc., Nov. 1882.

AMOMEACEÆ

Arrow Root—Manufacture in Queensland.—A writer in the "Queenslander" gives an interesting description of the method of the manufacture of arrow root pursued in Queensland, which is reproduced in "Weekly Drug News," Aug. 25, 1882.

Canna Edulis Sterilis—Food Value.—E. A. Carriere draws attention to this plant, the tubers of which are recommended as food for man and beast. The variety *edulis* contains 90 per cent. of water, and 1.88 per cent. of sugar; the variety *discolor* 80 per cent. of water and 0.48 per cent. of sugar. This latter variety contains a starch closely resembling that of arrow-root. As the stems and leaves are rich in nitrogenous matter, they may be cut up and mixed with clover, oats, etc., and used as fodder for animals; as food, the tubers may be boiled and then baked, or used as a salad. The cooking should not be conducted in metal vessels, on account of the presence of an acid not yet investigated.—Jour. Chem. Soc., Sept. 1882, 990, from Bieder Centr. 1882, 331.

Green Ginger—Use for Preparing a Soluble Essence of Ginger.—See *Essence of Green Ginger*, under "Pharmacy."

ORCHIDACEÆ.

Vanilla—Cultivation in Guadeloupe.—Seven or eight years ago a new vanilla plantation was established in Guadeloupe, and for several years the vanilla has been met with in French commerce. It is quite distinct from the Mexican and Bourbon vanilla, and is thought by Professor Charbonnier to be probably derived from a variety of vanilla planifolia, and, perhaps, to undergo a different process of curing. Instead of being irregularly triangular, it is always flattened, of a blackish color, rather less dark than in the Bourbon and Java vanilla, is less frequently covered with crystals of vanillia, has a distinctive odor, is little wrinkled, and is marked with fine striæ in a longitudinal direction. While it is of good appearance, resembling Bourbon vanilla, its odor is less fine, and on use disappears quite rapidly. It is sold at about one-half the price of Bourbon vanilla.—Amer. Jour. Phar., June 1883, 327, from Rép. de Phar., 1883, p. 18.

NYMPHACEÆ.

Nymphaceae—Chemistry.—According to W. Grüning the seed of

Nuphar luteum contains *nuphartannic* acid ($C_{56}H_{56}O_{37}$) in considerable proportion. It is a light yellow mass, easily rubbed into powder, preciptitates ferric salts blue black, and shows the general reactions of tannins; is is associated with *nuphar-phlobaphene* ($C_{56}H_{50}O_{35}$). The rhizome of *Nymphæa alba* contains *tanno-nymphæin* ($C_{56}H_{52}O_{36}$) and *nymphæo phlobaphene* ($C_{56}H_{48}O_{36}$). The tannin proper, *nymphæa tannic acid* ($C_{56}H_{58}O_{38}$), forms a brown-red transparent mass, which readily yields a pale yellow powder, and has the general reactions of tannin. When heated in a sealed tank, placed in a water-bath, in the presence of sulphuric acid, it is split into ellagic acid, gallic acid, and two substances, one of which is easily oxidized in the air to phlobaphene, while the other yields two bodies resembling viridinic acid. The *nuphar tannin* is split into an acid resembling ellagic acid, a compound precipitating gelatin and precipitable by alcohol, gallic acid, and a substance changing by oxidation to a compound resembling viridinic acid.—Amer. Jour. Phar., Feb. 1883, 96, from Chem. Ztg., 1882, p. 67; Arch. d. Phar. (3), xvii. 736.

LAURACEÆ.

Chinese Camphor—Adulteration.—F. Newcome, in a paper on the Chinese Materia Medica communicated to "Medical Press and Circular (Aug. 2, 1882)," draws attention to the fact that China camphor is grossly adulterated with a glue obtained by boiling a rattan creeper, locally called T'êngtsai. This weed, growing luxuriantly in the interior of Formosa, is full of a glutinous matter which boiling converts into a colorless glue. Mixing this with the pure camphor and a small percentage of water prevents evaporation, and camphor so adulterated will keep, it is said, for a couple of months without loss. In certain samples offered in the Tamsui market, the existence of two parts of glue to three of camphor was demonstrated. The foreign body is readily detected by fire. Samples of the plant yielding the glue have been secured by Mr. Walter Lay, but it has not yet been identified.—Phar. Jour. Trans., Sept. 16, 1882, 223.

Cassia Lignea—Origin.—It is remarkable that up to the present time nothing certain had been ascertained with regard to the origin of Cassia lignea. Mr. M. T. Thiselter Dyer now communicates abstracts from a report to the Hong Kong government by Mr. Charles Ford, who was commissioned to visit the Cassia districts of the West River (the Sai Kong), with the object, too, of reporting on the cultivation and collection of *Cassia lignea*, as well as of bringing back living and dried botanical specimens of the plant for distribution. In this Mr. Ford has succeeded admirably. He gives an account of the geographical position and extent of the Cassia districts, from which the following is taken:

"There are three chief districts where the Cassia is cultivated, viz.: Taiwu, in lat. 23° 34′ N., and long. 110° 18′ E. in the Kwangi province; Lukpo, in lat. 23° 6′ N., and long. 112° 24′ E.; and Loting, in lat. 22° 52′ N., and long. 111° 8′ E., both in the Kwangtung province. These are the market towns of the district; but the cassia is cultivated over a large area of country stretching to considerable distances from the towns, the extent of which could not be ascertained, owing to the unreliable accounts given by the different people questioned, who either had very vague notions of area, or were disinclined, as they usually are, to give information to foreigners."

From each of the districts of Taiwu, Lukpo and Loting, Mr. Ford obtained and sent to Kew copious and excellent specimens. These have been examined by Professor Oliver, who informs the author that they certainly all belong to the same species, and that this is undoubtedly *Cinnamomum Cassia*, Blume. Mr. Ford took great pains to ascertain if this was the exclusive source of *Cassia lignea*, and he reports that this is the *only* tree from which cassia bark 'buds,' or leaves of commerce in China, so far as could be ascertained from personal inspection and reports, are obtained.

Mr. Ford's account of the mode of collecting and preparing the bark, etc., is accompanied by a full set of the implements used, which are deposited in the Kew Museum. It is as follows:

"*Bark.*—When the trees are about six years old, the first cut of bark is obtained. The season for barking commences in March and continnes until the end of May, after which the natives say the bark loses its aroma, and is therefore not removed from the trees. The branches, which are about an inch thick, being cut to within a few inches of the ground, are carried to houses or sheds in the vicinity of the plantations All the small twigs and leaves being cleared off, a large-bladed knife, with the cutting-edge something like the end of a budding knife, is used to make two longitudinal slits and three or four incisions, at sixteen inches apart, round the circumference through the bark; the bark is then loosened by passing underneath it a kind of slightly curved horn knife with the two edges slightly sharpened. Pieces of bark sixteen inches long and half the circumference are thus obtained.

"The bark, after its removal and while it is still moist with sap, is then laid with the concave side downwards, and a small plane passed over it, and the epidermis removed. After this operation the bark is left to dry for about twenty-four hours, and then tied up in bundles about eighteen inches in diameter, and sent into the merchants' houses in the market towns.

"*Leaves.*—The leaves which are cleared from the branches that are barked are carefully preserved and dried, and afford by distillation Cassia oil. A large number of leaves are sent to Canton, where, he was told, the operation of distilling is performed.

"*Twigs.*—These are removed from the cut branches at the same time as when the leaves are obtained. They are a marketable commodity for native uses.

"*Buds.*—Cassia buds are the immature fruits. They are gathered when about one-eighth grown. Buds, and the seeds which are annually required for sowing, are obtained from the trees ten years and upwards of age that are left standing at about fifty and a hundred feet apart amongst the trees which are cut down every six years for their bark. These seed-bearing trees are not cut unless there is a demand for the very thick bark on their trunks, when some of the trees which can be conveniently spared are sacrificed."—Amer. Jour. Phar., Mar. 1883, 134–140, from Phar. Jour. and Trans., January 20, 1883.

Cinnamomum Zeylanicum, Cassia Lignea, etc.— Distinction of their *volatile oils*, which see under "Organic Chemistry."

Laurus Californica—Peculiar Fat in the Fruit.—Attention has again been directed to the California bay tree, which is also known under the name of

Umbellularia Californica, by the discovery in the nut of a new acid of the fatty series, which has been isolated and studied by Messrs J. M. Stillman and E. C. O'Neill.

The nuts being divested of their shells and fleshy husks, are well ground in a mortar and digested with ether in a percolating apparatus. The ether is then distilled off, leaving a pure fat, which solidifies on cooling to a hard tallowy mass, melting at 31° to 32° C., and having, in the melted state, a specific gravity of 0.925 at 31°. Its taste is disagreeable, producing irritation in the throat, due perhaps to a certain amount of free acid. The fat dissolves readily in ether and benzol, but only sparingly in alcohol. On analysis, it gives carbon 71.24, hydrogen 11.91, whence the authors have given it the formula $C_{11}H_{22}O_2$, showing it to be a member of the acetic series, and they give it the name of *umbellulic acid.* When purified as completely as possible, it is a white crystalline solid, of a peculiar taste, which irritates the mucous membrane of the throat. It distils at ordinary pressure without decomposition, boils at 270° to 275°, and forms a series of ethers with methyl, ethyl, amyl, etc., which can be prepared in the usual manner by passing hydrochloric-acid gas into the corresponding alcoholic solutions, and are mobile fragrant liquids. Some of these promise to become products of considerable interest. As it is, the discovery of a new acid of the acetic series will form the starting-point, should it be confirmed, of a number of very interesting researches. —New Rem., Feb. 1883, 50.

Umbellularia Californica, Nuttall (*Oreodaphne*, Nees.; *Tetranthera*, Hook)—*Presence of a Peculiar Fat in the Seeds.*—I. M. Stillman and E. C. O'Neill have extracted from the seeds of the California laurel, by means of ether, a tallow-like fat, melting at 31° to 32°C., having in the melted state the specific gravity 0.925, and possessing a disagreeable, irritating taste, which is probably due to a little free acid. The fat is sparingly soluble in alcohol, but dissolves freely in ether and benzol. It contains a new fatty acid, *umbellulic acid*, of the formula $C_{11}H_{22}O_2$, melting between 31° and 34°, and when heated emitting a disagreeable, irritating odor. The pure acid is white crystalline, irritating to the mucous membranes of the throat, boils under ordinary pressure between 270° and 275° C., and distils without decomposition.—Amer. Jour. Phar., Dec. 1882, 625, from Amer. Chem. Jour., iv. 206–211.

POLYGONACEÆ.

Polygonum Hydropiperoides, Mich.—*Value as Emmenagogue.*—An editorial in the "Medical News," Dec. 9, 1882, directs attention to this indigenous plant, of which the late Dr. Eberle, in his work on Materia Medica and Therapeutics, speaks as the most active and certain of the emmenagogues. He obtained his knowledge of it from a country practitioner, who made it the subject of his thesis as a candidate for the doctorate at the medical school where Eberle then held the chair of practice. The late Prof. M. B. Wright, of Cincinnati, held it in equal estimation, and during his long career prescribed it often with success. It has very decided stimulant, even vesicating property, when rubbed into the skin, whence its common name, *smartweed.* The form most convenient for its administration is the fluid extract, given from 5 to 30 minims, three or four times a day ; mixed with some glycerin or wine it can be readily taken. The activity of this drug is due probably to the presence of polygonic acid, which was isolated by Dr. C. J. Rademaker fram Polygonum hydropiper, Lin.—Amer. Jour. Phar., April 1883, 195.

Buckwheat Flour—Detection of Rice Flour.—Mr. Aug. Lehn communicates a paper on the detection of rice in buckwheat flour, from which the following is extracted :

About 1 gm. of the flour was warmed upon a water-bath, with 2 gms. of concentrated solution of potassa and water, until a paste had become formed, and hydrochloric acid then added. With rice flour the paste became yellowish, and, on the addition of HCl, white.

With buckwheat the paste was dark green, and, after treatment with HCl, assumed a red color.

With a mixture of the two, the paste became green in spots, and, with HCl, of a flesh color.—Amer. Jour. Phar., June, 1883, 199, from Pharm. Centralhalle, 4, p. 130, through Chem. Ztg., 1883.

Rhubarb—Cultivation in Moravia.—The culture of Rheum compactum in Moravia was commenced, in the beginning of the present century, by Prikryl, apothecary in Austerlitz. Until about 25 or 30 years ago the root was largely exported to Lyons and Milano, where it was used for dyeing silk. With the use of chemicals for dyeing, the price of this rhubarb receded to about 10 florins per hundredweight, but more recently has advanced again, and is about 1 florin per pound for triennial roots. This rhubarb is again largely exported, chiefly to Russia, whence it is exported again as Asiatic rhubarb. Prof. Dr. A. Vogl has pointed out histological differences by which this article may be distinguished from Chinese rhubarb ; but a correspondent insists that even in this respect it will resemble the latter much more closely if permitted to remain in the ground for 5 or 6 years. The commercial article is said to yield extracts, tinctures and infusions which, not only in color, odor and taste, but likewise in activity, compare favorably with the corresponding preparations of Chinese rhubarb. The author urges the employment of this rhubarb, partly for patriotic reasons as far as Austria-Hungary is concerned, but chiefly on account of its low price and its good effects, these being fully secured if 5 parts of Moravian rhubarb be used in place of 4 parts of the Chinese root, as was pointed out already, in 1808, by Trommsdorff. —Amer. Jour. Phar., Sept. 1882, 463, from Phar. Post, June 16, 1882, p. 206–209.

Rhubarb—Examination of the Commercial Powder.—Mr. Geo. W. Hays has contributed a highly interesting essay on the purity of commercial powdered rhubarb, which is particularly important because it shows the fallacy of some of the tests at present recognized in standard works, and points out the manner in which, by comparative tests, the quality of powdered rhubarb may be estimated. For the particulars of these tests, and the examinations made, reference must be had to the author's paper; a brief synopsis may find place here.

The tests were divided into five sections, namely: physical, pharmaceutical, chemical, microscopical, and physiological. The samples, of which twelve were subjected to all of these tests, whilst seventeen were examined only for turmeric, were compared with a carefully-selected "standard," selected for the author by Mr. Charles Bullock, as "a fair representative of the market at the present time—*of a good article*—of Chinese Rhubarb." The results are given in a series of tables, and are summed up by the author in the following:

General Conclusions.—1. Out of 12 samples, four (4), or 33 per cent., were adulterated with *Rhapontic Rhubarb.*

2. Out of 29 samples, two (2), or nearly 7 per cent., were adulterated with turmeric.

3. From the stains left by a chloroformic tincture of the samples on filtering paper (Howie's test), together with the "Chemical Tests," it is believed that at least 25 per cent. of the samples were adulterated with inferior, poor, dark-colored, perhaps worm-eaten, rhubarb.

4. Taking all of the "Pharmaceutical Tests" together, none of the samples equalled the "standard."

5. Chemically, the "standard" was the fourth in *purgative power* (cathartic acid), and the second in *tonic constituents* (chrysophanic and tannic acids).

6. The *price* is no *just criterion* of either the cathartic or tonic power of the drug.—Pharmacist, Mar. 1883, 89–100.

PLANTAGINACEÆ.

Plantago Lanceolata—Value as a Styptic.—Professor Quinlan has found the leaves of this plant to be locally used in certain parts of Ireland as a styptic, and that they are remarkably efficient. It is remarkable, also, that modern writers do not mention the plant in this connection, whilst older writers, from "Pliny down to old Culpepper" refer to it enthusiastically. Prof. Quinlan believes both indigenous varieties—*Plantago lanceolata*. var. *vulgaris*, and *P. lanceolata*, var. *timbali*—to be useful, and has had preparations made from them, as follows:

1. The dried leaves of both plants. They are intended for external application, and their action is partly physiological and partly mechanical. In fact, it much resembles that of Matico, and like it, it is somewhat ribbed.

2. A species of external linctus, comprising the leaves pounded in a mortar, with glycerine added to preserve them. This is intended to imitate the chewed leaves (the form in which he first saw them successfuly used), and to be available at a time of year when the green leaves might not be forthcoming.

3. The juice preserved with alcohol, and the same preserved with glycerine; the first intended for internal use has a hot astringent taste, but not disagreeable. The second is designed for physiological experiments on the capillaries.

4. The green extract, made from the juice in the ordinary way, the chlorophyl coagulum being separated and added last. With this the author has not yet obtained satisfactory results. Yearbook of Pharm., 1882, 405–408.

GLOBULARIACEÆ.

Globularia Alypum—Constituents of the leaves.—The leaves of *Globularia Alypum* contain, according to E. Heckel, fat, wax, tannin, globularin, cinnamic acid, mannit, glucose, resins, gummy and coloring matters, 2.1 per cent. of ash, 26.2 water, and 13.1 cellulose. The globularitannic acid of Walz was a mixture of tannin and coloring matter. Globularin is a glucoside, but does not yield paraglobularetin; globularetin is at first oily or resinous, gradually becomes transparent and amorphous, and when dissolved in hot alkaline solutions, combines with the elements of water, forming cinnamic acid. A small quantity of a volatile aromatic compound, probably benzyl cinnamate, was likewise found in the leaves.—Amer. Jour. Phar., Dec. 1882, 625, from Comp. Rend., cv., p. 90–93.

SCROPHULARIACEÆ.

Veronica Salicifolia and *V. Parviflora—Remedial Value.*—These are known in New Zealand as "koromiko," and employed as a remedy for diarrhœa. The drug has been used by Dr. J. Jardine, of Kiukiang, in

China, who reports that cases of dysentery, which had varied in duration from six weeks to four years, were cured by four or five doses of the drug. —Am. Jour. Phar., Oct 1882, 512, from Phar. Jour. Trans., July 29, 1882, 85.

SOLANACEÆ.

Belladonna—Comparative Value of the Plants at Different Periods of Growth.—In a former communication to the British Pharmaceutical Conference (see Proceeedings 1882, 400), Mr. A. W. Gerrard had demonstrated that the wild variety of belladonna was richest in atropine; and, contrary to general opinion, the leaf in both varieties was found richer than the root. In continuation, Mr. Gerrard has, during the past summer (1882) been able to examine two specimens of the first year's growth of the plant; likewise the second year's growth at these periods of development, viz: before, during, and after flowering; with the object to determine at what period the latter attains its maximum therapeutic value. The results were as follows:

Atropine in 100 Parts Wild Belladonna. First Year's Growth.

	Roots.	Leaves.
From chalk soil (grown in Yorkshire)	.21	.23
From leaf mould (grown in Sussex)	.09	.22

Atropine in 100 Parts Cultivated Belladonna. Second Year's Growth.

When collected.	Leaves.	Roots.
May	.25	.21
June	.36	.32
July	.34	.32

The results show that the wild plant in the first year of its growth contains about half the quantity of atropine present in older wild plants, and that, as previously stated, a chalky soil favors the formation of atropine. They also show that the plant before flowering is not rich in active principle, but that at the period of flowering the full development is reached and maintained—both in roots and leaves—into the fruiting season. In these experiments also, as on the former occasion, the leaves have uniformly yielded more atropine than the roots.—Year Book of Pharm., 1882, 400–402.

Capsicum—Value in Rheumatism.—Powdered Capsicum as a remedy in sub-acute and chronic rheumatism has been recommended by Mr. A. Drummond MacDonald in the "British Medical Journal." Two drachms to the ounce of lard, to which one of the essential oils may be added to make it more elegant, is the proportion mentioned. It is to be thoroughly rubbed over the affected part by a gloved hand for ten minutes at a time, night and morning, or at bed-time only, according to the effect produced. Dry heat applied afterwards intensifies its effect, which lasts for some time.—Amer. Jour. Phar., April 1883, 200, from Weekly Med. Review, March 3, 1883.

Tobacco Smoke—Poisonous Constituents.—The poisonous constituents of tobacco smoke, according to R. Kissling, are carbonic oxide, sulphuretted hydrogen, hydrocyanic acid, picoline bases and nicotine, the first three being present in too small a proportion, and their volatility being too great for exerting any important influence. The picolines are likewise present in relatively small quantities, and the toxic action of tobacco smoke is mainly due to nicotine, of which but little is destroyed in smoking cigars.—Amer. Jour. Phar., Dec. 1882, 628, from Dingl. Polyt. Jour., Vol. 244, p. 234–246.

Naphthol.—Formulas for *ointment* and for *liniment*, which see under "Pharmacy."

Puneeria Coagulans—A Vegetable Substitute for Rennet.—Sir J. D. Hooker draws attention to the discovery that the fruit of *Puneeria coagulans*, a shrub common in Afghanistan and Northern India, possesses the property of coagulating milk. This is important, inasmuch as cheese to be salable amongst the natives of India should be made with some vegetable rennet. In point of fact, the discovery is due to researches made with this object in view under instructions from the Government of India. It has been ascertained that an ounce of the pounded capsules in a quart of water is a very suitable strength for use; a tablespoonful of the liquid serving to coagulate a gallon of warm milk in about half an hour. The anxiety as to the possible poisonous character of the fruit has been removed by experiments which indicate its perfect safety in the proportion named. Moreover, the *Puneeria*, though belonging to the *Solanaceæ*, is a member of the tribe *Solaneæ*, which appears to be generally free from poisonous principles, and abounds, in fact, in plants producing fruits which daily experience shows to be innocuous.—Phar. Jour. Trans., Jan. 20, 1883, 588–589, from "Report on the Royal Gardens at Kew."

Mullein Leaves—Value in Pulmonary Consumption.—The leaves of Verbascum Thapsus are popularly used in Ireland, in consumption, and the plant, in addition to growing wild, is cultivated in gardens, occasionally on a rather extensive scale. The mullein is administered by boiling an ounce of the dried leaves, or a corresponding quantity of the fresh ones, in a pint of milk for ten minutes, and giving the strained liquid warm, with or without a little sugar. From his observations, Dr. F. J. B. Quinlan regards mullein as having a distinct weight-increasing power in early cases of pulmonary consumption. The hot decoction causes a comfortable sensation, and when patients take it they experience a physiological want for it. It eases phthisical cough, some patients scarcely requiring cough medicines at all. Its power of checking phthisical looseness is very marked, and it also gives great relief to the dyspnœa; but for phthisical night-sweats it is utterly useless. In advanced cases it does not prevent loss of weight.

The decoction in milk is liked by the patient; in watery infusion it is disagreeable, and the expressed juice preserved by glycerin still more so. —Amer. Jour. Phar., May 1883, 267, from Brit. Med. Jour.

LABIATÆ.

Peppermint Plants—Protection During Winter.—In reply to an inquiry how peppermint plants may best be protected during the winter, several correspondents of the "Pharmaceutische Zeitung" advise them to be covered with horse-dung, which should be laid over loosely. This not only manures the ground, but has the additional advantage that the lateral roots grow more vigorously under such protection. Another correspondent recommends covering them with a thin layer of loose earth (1 to 2 *cm.* deep), afterwards with a layer of straw manure.—New Rem., Jan. 1883, 16.

Japanese Peppermint Plant—Distinction from the Chinese Plant.—Mr. E. M. Holmes, after much difficulty, succeeded in obtaining authentic living specimens of Chinese and Japanese peppermint plants, both of which are referred by botanists to *Mentha arvensis*, var. *Javanica.* His attention had been attracted to the subject by the difference in taste from that of peppermint in the specimens of these plants within his reach, one specimen having the taste of *M. viridis*, the other that of *M. arvensis*. On careful examination, both the Chinese and Japanese plants thus obtained were found to possess the botanical characters of *Mentha arvensis*, as defined in De Candolle's "Prodromus;" the leaves being stalked, ovate lanceolate, and the hairs on the stems and pedicels reflexed, those of the calyx being erecto-patent, and those of the upper surface of the leaf appressed, the calyx being bell-shaped with acute lanceolate or narrowly-triangular teeth. The Chinese plant differs from the Japanese one in the leaves being narrower in proportion to their length, and in the calyx teeth being shorter and more broadly triangular. In outline, the leaves of both plants taper more to the base and have a longer petiole than the English forms of *M. arvensis*, coming very near to *M. canadensis* in this feature. The latter plant however, has spreading hairs on the stem. The Chinese plant appeared to so nearly resemble *M. canadensis*, var. *glabrata*, that the author applied to Professor Asa Gray for specimens of that species for comparison. The specimens of *M. canadensis* which he kindly forwarded were derived from different localities in the United States, and varied considerably in taste and appearance, some having the flavor of pennyroyal, others that of *M. viridis*, and others again that of peppermint, in a feeble degree. The specimen having a peppermint flavor is labeled *M. canadensis*, var. *glabrata;* it has reflexed hairs on the stem, and differs from the typical plant in having more triangular and shorter calyx teeth, which, as well as the petioles, have erect hairs; in fact, it appears in every respect to be the same plant as that grown at

Canton. It is not surprising, however, to find Japanese or Chinese plants extending to North America.

It appears then, that there are two plants possessing a widely different taste, and both referred to *M. arvensis*, var. *Javanica*, by botanists.

Dr. Franchet, one of the authors of the most recent "Flora" of Japan, believe the Japanese plant to be "a form of *M. arvensis*, characterized by the acuminate calycine segments, a feature which constantly occurs in specimens from Eastern Asia. The weight of opinion being on the side of considering the Japanese plant as a form of *M. arvensis*, D. C., the author recommends that for convenience the name of *Mentha arvensis* var. *piperascens* should be retained for the Japanese peppermint plant, and that of *Mentha arvensis* var. *glabrata* for the Chinese one.

There are some points in connection with peppermint which are extremely suggestive, and to which Mr. Holmes calls the attention of those who have greater ability and more time for investigation.

A number of varieties and forms of so-called species possess the same odor and flavor, as shown in the following list:

Mentha piperita, *Mentha arvensis*, var. *piperascens*, *M. canadensis*, var. *glabrata* (!), and *M. incana* (!), cultivated near Bombay for producing peppermint oil (Dymock).

Spearmint, *Mentha viridis*, L., *Mentha sylvestris* (!), *rotundifolia* (!) *sylvestris* (!), *canadensis* (!), *M. arvensis*, var.*

The questions then arise:

1st. Do the oils of these species differ among themselves, as is the case with those of *M. piperita* and *M. arvensis*, var. *piperascens?*

2d. If so, is this difference dependent on degree of development, on climate, soil, or sex?

3d. Is the soil in each case a mixture, in which one ingredient is present in variable quantity in the different plants?

4th. Do the oils of spearmint and peppermint bear any chemical relation to each other?

5th. Which species, containing the oil of peppermint, yields the largest quantity, and which the most valuable one for medicinal purposes?—Amer. Jour. Phar., Jan. 1883, 17–19, from Phar. Jour. Am. Trans., Nov. 11, 1882.

Monarda Fistulosa, Linn.—*Description.*—Dr. J. Mœller describes the leaves and flowers of this plant, see Fig 26. The leaves have a prominent midrib and secondary nerve; the latter anastomosing near the margin, are apparently smooth, but under the magnifying glass are seen to be hairy and densely punctate upon both surfaces. Under the microscope numerous small conical one-celled hairs, about .05 mm. long, are observed, occasionally with a somewhat longer several-celled hair; the hairs on the margin are 1 mm. long and many-celled; the glands are situated in depressions upon a broad stipe. The calyx is nearly 1 cm. long, tubular, many-ribbed, five-toothed, densely hairy on the margin, internally smooth, externally somewhat hairy and beset with yellow glands, which are visible under the magnifier. The mint-like odor becomes prominent on rubbing; the taste is pungently aromatic—Amer. Jour. Phar., Sept. 1882, 460, from Phar. Centralh. No. 29, 1882.

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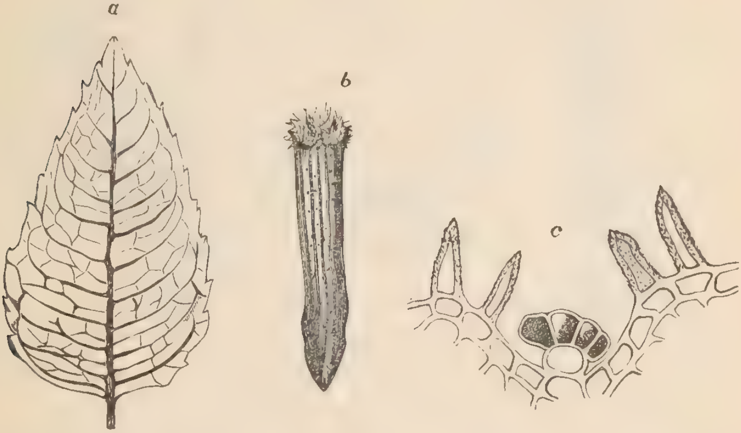
* Those marked (!) have been tested by Mr. Holmes.

FIG. 26.

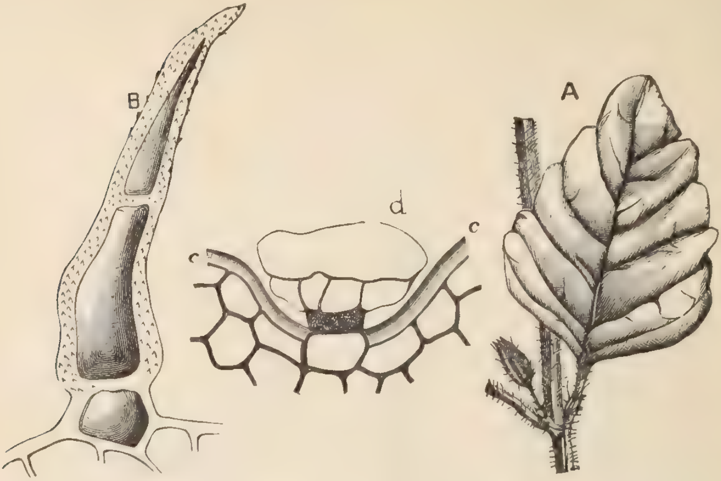


Monarda fistulosa, Linn. *a*, **Upper side of leaf, natural size.** *b*, **Calyx, slightly magnified.** *c*, **Epidermis from lower surface of leaf, magnified 160 ×.**

Micromeria Douglasii, Benth—*Description.*—This is known as *yerba buena*, a labiate plant of Northern California and Columbia, and has been recommended as an anthelmintic, emmenagogue, and febrifuge. The drug is described by Dr. J. Mœller as consisting of quadrangular hairy stems. The leaves are opposite, ovate, short-petiolate, obtuse, coarsely crenate, with the nerve branches running to the margin, and with sparse tertiary branches; the upper side almost smooth, the lower surface densely finely punctuate, and on the nerves hairy; the largest leaves 4 cm. (1$\frac{3}{5}$ inch) long and 3 cm. (1$\frac{1}{5}$ inch) broad; the upper leaves smaller and more acute. The axillary pedicels are thin, about 7 mm. long; the calyx, mostly detached, is elliptic, 4 mm. long, 5 mm. broad, five-toothed, many-ribbed, hairy, internally naked, and contains at its base 4 nutlets. The drug has a slight aromatic odor, and an aromatic, somewhat bitter taste.

The cuticle on both surfaces of the leaves is firm. The hairs are firm, conical, mostly two-celled, and rest, with a broad base, upon the somewhat prominent parent cell. The glands are contained in concave depressions, are depressed, have a simple stipe-cell, and contain a yellow

Fig. 27.



Micromeria Douglasii. *a.* Leaf and calyx, natural size. *b.* Simple hair, magnified 300 diam. *c.* Cuticle; and *d.* Gland, magnified 300 diam.

secretion.—Amer. Jour. Phar., Sept. 1882, 461, from Phar. Centralhalle, 1882, No. 29.

Betonica Officinalis—Uses in Greece as Tea-plant.—According to Professor X. Landerer, this is collected by the monks of Agion Oras on Mount Athos. It was called *kestron* by Dioscorides, and was, and is still, highly valued as a remedy in many complaints, and as such is frequently sent to friends as a present.

In this connection, Professor Maisch observes that the *kestron* of Dioscorides is generally referred to *Betonica Alopecurus*, Lin., which is rather common in Southern Europe.—Amer. Jour. Phar., Jan. 1883, 4.

CONVOLVULACEÆ.

Jalaps—Morphological and Chemical Researches.—A. Bouriez remarks that in commercial specimens of any kind of true jalap (tuberous, fusiform, or Tampico) several varieties of tubercules can be distinguished by their external characters. Those which constitute the greater part of the jalap, and which he designates under the name of "typical tubercules," always present at one of their extremities (the upper) the remains of aerial organs. Sometimes they terminate in a point at both their extremities; sometimes one of the extremities only becomes slender, whilst the other presents a large surface of insertion. There are met with, besides, tubercules inserted on other tubercules, and very small fragments (*grabeaux*) showing tubercules inserted upon an organ which is most frequently slender and cylindrical, but sometimes fusiform and more or less swollen. The question presented itself to the author, whether these tubercules of the different varieties answered to variations in appearance of one and the same organ, or whether they represented organs of a different morphological nature.

The author's investigations lead him to the conclusion that the typical tubercules of jalap represent the stock of the convolvulaceous plants which produce them, and that the tuberized portion corresponds to hypertrophy: (*a*) of the base of the principal stem; (*b*) of the hypocotyledonous base; (*c*) of the region of insertion of the principal root upon the hypocotyledonous axis; and (*d*) of the upper part of the principal root.

He has studied in the same manner the various tubercules of jalap that never present the remains of aerial organs at one of their extremities, and has in this way recognized that

(1) Most of the varieties of tubercules represent tuberized roots of different orders;

(2) Some tubercules represent subterranean stems, which, having to play the same physiological *rôle* as the radical tubercules, are tuberized by the same process and present a nearly identical structure.

Finally, comparison of the three commercial kinds has shown us, that in respect of structure there is no difference, however slight, between the different kinds of true jalap.

From the materia medica point of view, the jalaps are therefore principally formed of tubercules which correspond to the stocks of the convolvulaceous plants that produce them; they include, besides, a certain number of tubercules which represent tuberized roots of different orders; lastly, tubercules are met with derived from tuberized subterraneous stems.

Mr. Bouriez has, furthermore, made some chemical experiments, which do not agree with the opinion of M. Andouard that the small roots of jalap would be generally found more rich in resin than the large tubercules of the same plant. The resin was extracted from nine specimens of jalap by the Codex process, with the following results. The aqueous extract was also ascertained, the figures giving such evaporated a pilular consistence.

	Resin dried at 100°. Per cent.	*Aqueous Extracts. Per cent.*
I. TYPE SPECIMENS OF JALAP.		
Supplied by the "Pharmacie Centrale."		
Tuberous or official jalap	12.5	38
Light jalap (small specimens)	2.0	35
Digitate major jalap	7.0	12
Digitate minor jalap	9.0	11.5
II. PICKED COMMERCIAL JALAP.		
No. 1	12.5	35
No. 2	10.5	33
No. 3	7.5	23
No. 4	8.0	17
III. DEBRIS	8.5	27

Amer. Jour. Phar., Jan. 1883, 29–34, from Jour. de Phar., through Phar. Jour. Trans., Nov. 11, 1882.

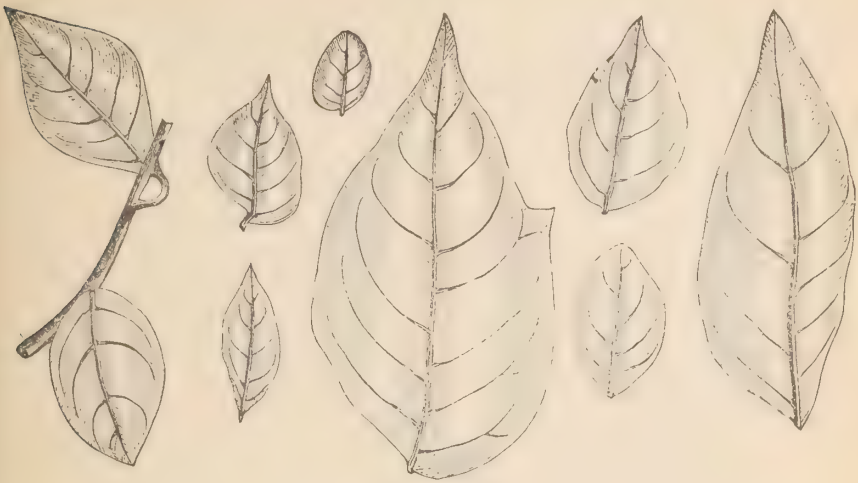
Jalap—Examination.—Virgil Coblentz has examined commercial air-dry jalap of fair quality, with the following result: *Moisture*, lost at 100° C., 7.76%; *ash*, consisting of sulphates, phosphates, chlorides and carbonates of potassium, sodium, calcium and magnesium, and silica, 11.016%; *benzol-extract*, of a yellowish brown color, 18.62%, which yielded to absolute alcohol a quantity of resin corresponding to 16.07% of the jalap. Of this *resin*, 5.12% was soluble in *ether*, soft, acid, greenish-brown, disagreeably acrid, and had the peculiar odor of jalap; the remaining 94.88% was neutral to litmus. The drug, after exhaustion by benzol, yielded to *80% alcohol*, 11.016% of a red-brown extract, 16.5% of which was soluble in absolute alcohol, and had an acid reaction, whilst the remaining portion was entirely soluble in water. *Cold water* took up from the drug (after being treated as above? Rep.) 5.18% of extract, consisting of gum and coloring matter. *Boiling water* extracted 7.2% of starch. *Dilute soda* dissolved 2.58% of albuminous and coloring matter. Twelve samples of *Powdered Jalap* were assayed for the resin, which was found to vary from 3.8 to 16.2%, the average being 8.1%.—Amer. Jour. Pharm., Aug. 1882, 385–386.

Jalap—Testing.—The process recognized by the Germ. Pharm. for distinguishing between the two sorts of true jalap—the light and heavy—consists in the assay of the resin. This is too circumstantial, and, what is more important, can only be extended to *one* tuber. Considering it important that *all* tubers contained in a lot should be examined, and their being no external criterion to distinguish between light and heavy tubers, Dr. H. Hager resorts to specific gravity. A solution of common salt is prepared, having a sp. gr. 1.140 to 1.142, by dissolving 200 grams of dry commercial table salt in 1.055 grams of water. About fifty tubers are then immersed in this liquid; while being stirred, at a temperature of 15° to 17° C. Floating tubers should be carefully freed from air bubbles adhering to their surface, when they will become readily wet. Not less than ninety out of every hundred tubers should sink in this liquid, and all that do not sink should be rejected by the pharmacist, since good tubers have a sp. gr. between 1.150 and 1.180. Indeed, the author thinks that on further examination it may be found permissible to raise the standard to 1.150 instead of 1.142. After examination, the tubers are put into a sieve, washed off with water, and dried with a linen cloth.—New Rem., Oct. 1882, 295, Am. Jour. Phar., Sept. 1882, 463, from Phar. Centralh. 27, 1882.

BIGNONIACEÆ.

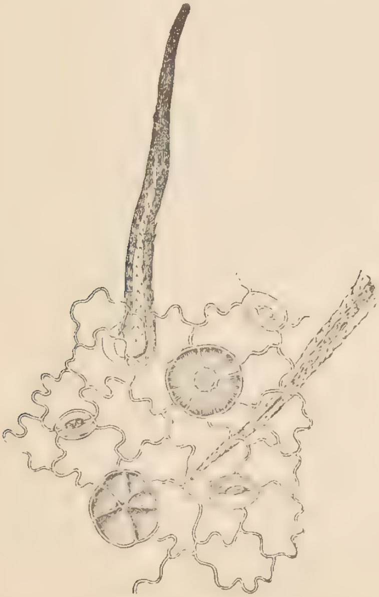
Jacaranda Procera, Sprengel—*Description of the Leaves.*—The dry leaves, examined by Dr. J. Mœller, are of various shades of light green and brown, and variable in size and shape; but there are intermediate forms, agreeing in all other characters, which renders it probable that the drug is derived from one species only. They are asymmetric, particularly near the base, are somewhat leathery, slightly revolute, the upper surface

FIG. 28.



Different Forms of the Leaflets of Caroba, Natural Size.

FIG. 29.



Lower Surface of Caroba Leaf × 300.

glossy, apparently smooth, the lower surface on the veins and near the margin velvety hairy; the petioles are occasionally short, and the secondary nerves anastomosing near the margin. The cuticle of the upper surface is thicker than upon the lower surface, the palissade layer is simple, the mesophyll rather dense. The epidermis consists of sinuate cells with numerous stomata on the lower surface, and upon both surfaces with two kinds of hairs, either one-celled, conical, obtuse-pointed, rough, thick-walled and about 0 5 millimeter long, or short-stiped, flat, formed of 6 or 8 stellately arranged cells, and containing an amber-colored secretion.

The drug is inodorous, and has a bitter and astringent taste.—Amer. Jour. Phar., Oct. 1882, 513, from Phar. Centralh. 1882, 342–344.

Gelsemium Sempervirens.—Forensic-chemical Determination of its Alkaloid; Characters of some of its Important Constituents, etc. See *Gelsemine*, *Gelsemic Acid*, and *Aesculin*, under "Organic Chemistry."

Gelsemium Sempervirens—Extraction of Alkaloid in Pure Condition.—See '*Gelsemine*' under "Organic Chemistry."

APOCYNACEÆ.

Apocynum Cannabinum, L.—*Proximate Constituents.*—See "*Glucosides*," under "Organic Chemistry."

Nux Vomica—Analysis of Some Authentic Specimens.—Messrs. Wyndham R. Dunstan and F. W. Short, having secured some authentic specimens of nux vomica, have subjected them to chemical examination, the results being now communicated, together with the method pursued in the analysis. Two series of specimens having come into their possession—the one in 1877, the other in the present year—the results have been tabulated separately, and they show that although the specimens in the two series differ in alkaloidal content, the order of content in each series is precisely the same—that is, Bombay first, Cochin second, and Madras third. The pharmaceutical aspect of the great difference in the alkaloidal content of the various specimens is of no small moment; and upon this point the authors propose to dwell at a future time, as well as upon an accurate method for the separation of strychnine and brucine. For table see opposite page.

SERIES I. (COLLECTED 1877.)

SPECIMEN.	Diameter.	Thickness.	Circumference.	Nature of Edge.	Texture.	Form.	Interior.	Percentage of Strychnine and Brucine.
Bombay: fine.	20.25 to 25.5 mm. Average, 23.0.	4.0 mm.	60.0 to 82.5 mm. Average, 70.0.	Generally acute.	Very silky.	Nearly flat; fairly regular; few concavo-convex and bent.	Cotyledons 7-veined; two outer veins small.	3.46
Bombay: ordinary	19.0 to 28.0 mm. Average, 23.0.	5.0 mm.	60.0 to 82.5 mm. Average, 70.0.	Generally rounded; some acute.	Silky.	Nearly flat; some irregular; few concavo-convex.	Cotyledons 7-veined; two outer veins small.	3.14
Cochin.	19.0 to 28.0 mm. Average, 23.0.	4.0 to 6.0 mm. Average, 5.0.	57.0 to 79.0 mm. Average, 68.0.	Round; few acute.	Silky.	Nearly flat; some concavo-convex; many irregular.	Cotyledons 7-veined; two outer veins small.	3.04
Madras.	12.5 to 23.0 mm. Average, 18.0.	4.0 to 5.0 mm. Average, 4.5.	38.0 to 71.0 mm. Average, 57.0.	Generally round; seldom acute.	Dull.	Nearly flat; some slightly concavo convex; some irregular.	Cotyledons 7-veined; two outer veins small; albumen resinous.	2.74

SERIES II. (COLLECTED 1883.)

SPECIMEN.	Diameter.	Thickness.	Circumference.	Nature of Edge.	Texture.	Form.	Interior.	Percentage of Strychnine and Brucine.
Bombay.	20.0 to 28.0 mm. Average, 23.0.	2.25 to 4.0 mm. Average, 3.5.	59.0 to 84.0 mm. Average, 73.0.	Nearly all acute.	Very silky	Nearly flat; fairly regular; some concavo-convex.	Cotyledons 7-veined; two lateral veins small and sometimes indistinct.	3.90
Cochin.	19.0 to 28.0 mm. Average, 25.0.	4.0 to 5.0 mm. Average, 4.5.	57.0 to 84.0 mm. Average, 74.0.	Round.	Slightly silky.	Nearly flat; few slightly concavo-convex.	Cotyledons 7-veined; two lateral veins indistinct.	3.60
Madras.	12.5 to 21.5 mm. Average, 19.0.	4.0 to 5.0 mm. Average, 4.75.	38.0 to 65.0 mm. Average, 57.0.	Round.	Dull.	Nearly flat; some slightly concavo-convex.	Cotyledons 7 veined; two lateral veins indistinct; albumen resinous.	3.15

—Phar. Jour. and Trans., June 23, 1883, 1053–1055.

Oleander—Proximate Constituents.—See "Glucosides" under "Organic Chemistry."

Guachamaca—A New South American Remedy.—According to Dr. Schiffer, an *extract of Guachamaca*, a Venezuelan plant belonging to the Apocynaceae (?), is reputed to have wonderful effects in allaying convulsions of the motor apparatus. The best and most simple preparation is an aqueous extract, prepared on the water-bath. It contains an alkaloid, soluble in water, but little soluble in absolute alcohol, and insoluble in ether and chloroform, resembling, in this respect, as well as in its physiological action, curare. Physiological experiments made by Dr. Schiffer lead him to the belief that the remedy may be found valuable in diseases involving an exaggerated action of the motor apparatus, and possibly also as a general hypnotic. The extract has been administered hypodermically with good results in doses of 10 milligrams.—New Rem., Aug. 1882, 231.

Curare—Artificial Production.—Mr. Rabuteau exhibited at a meeting of the Paris Biological Society, held February 25th, a chemical compound which is stated to possess physiological properties closely analogous to those of curare. This compound is the *iodide of methyl-triethyl-stibonium*, $Sb(C_2H_5)_3(CH_3)I$, and is a white crystallizable salt, soluble in water and in alcohol, and having a bitter taste. The editor of Amer. Jour. Phar., (Aug. 1882, 430) draws attention to the fact that the stibethyl compounds were investigated by C. Loewig and E. Schweizer in 1850, those of ethylstibonium by R. Loewig in 1855, and the compounds of stibmethyl and methyl-stibonium by H. Landolt in 1851; their soluble salts have a bitter taste.

Thevetia Nereifolia—Presence of a Second Poisonous Principle in the Kernels.—Dr. C. J. H. Warden has continued his examination of the kernels of *Thevetia nereifolia* (see Proceedings 1882, 184) and has detected a second principle having poisonous properties. The lack of material has so far prevented a complete examination, but the new principle appears to differ from *thevetin*, hitherto isolated by Dr. De Vrij, and by himself, in a marked manner. Unlike thevetin, it is non-crystalline and persistently bitter. It is readily soluble in water, and was obtained by precipitating the mother liquor left after the crystallization of thevetin by tannic acid, and decomposing the precipitate by lime.—Phar. Jour. Trans., July 15, 1882, 42.

SAPOTACEÆ.

Zapoto Gum.—Dr. A. M. Boyd, U. S. Consul at Belize, British Honduras, contributes some interesting information relative to the caoutchouc-like substance known in commerce, as *Gum Chicle*, *Babata Gum*, etc.

The tree from which the chicle is obtained is called the Zapoto chica, Zapotillo, and the native or Indian name is Xiconzopotl. It bears a fruit about the size of a small peach, of a dark color, with a rough skin, like the bark of a tree; has a large, smooth, black seed, and is a delicious fruit to eat. The leaves are long and narrow, much resembling the peach leaf, while that of the India-rubber is broad and long. The wood of the Zapoto is extremely hard and durable, and susceptible of a very fine polish, and is used largely for building purposes. That of the India-rubber tree is soft and spongy, and very perishable.

The Zapoto often attains the height of from sixty to eighty feet, and a diameter of over two feet. It abounds in the lowlands of the Gulf coast, in the *terra caliente*, or hot regions. The mode of obtaining the milk from the tree is to belt the tree from the ground upward in a diagonal direction around the tree, down which the milk flows into vessels set to receive it. The mode of preparing it for the market consists in boiling the milk in kettles until it coagulates, when it is formed into blocks weighing from one to twenty-five pounds, in which form it comes into market. Owing to the careless manner with which the natives treat the trees, the supply is becoming exhausted.

The season for collecting it begins about the first of November, and continues until the last of March. This season, now closing, has produced, to date, over 200,000 pounds, all of which has been shipped to the above ports. The use to which it is applied appears to be the manufacture of chewing gum. When bleached it is very white, and resembles paraffin, with which it is often mixed. So far as I am informed, it has not become an article of general commerce, but is largely consumed in some way.—New Rem., May 1883, 130.

STYRACEÆ.

Storax—Formation of a New Compound, "Styrogenin" by the Action of Sulphuric Acid. Mylius has found that storax and sulphuric acid yield under certain circumstances white needles insoluble in ether, for which he proposes the provisional name *styrogenin*. Several other crystalline compounds, which are, however, more freely soluble in ether, are produced at the same time. The composition of styrogenin appears to be $C_{26}H_{40}O_3$. It is sparingly soluble in alcohol, benzol and benzin, somewhat more soluble in hot toluol and amylic alcohol, very freely soluble in chloroform, in which solution, on the addition of bromine, substitution compounds are produced. It dissolves in cold sulphuric acid without alteration; but on warming an orange-red liquid is formed, from which water precipitates an uncrystallizable resin, soluble in ether. Styrogenin may be obtained from that portion of storax which is dissolved by boiling petroleum benzin; but it is not produced from styracin or storesin.—Amer. Jour. Phar., July 1882, 370, from Phar. Centralh., 1882, p. 79 to 81.

Storax—Purification.—Benzol used for the purification of storax has many disadvantages, such as inflammability of the vapor, its diagreeable odor, the high temperature as which it volatilizes completely, and its yellow color as frequently found in commerce. Schlickum proceeds as follows: 100 parts of storax are gently heated, 10 parts of alcohol are stirred in, the mixture is allowed to cool, an equal volume (about 60 to 70 parts) of ether is added, and this mixture passed through a covered plaited filter; the residue is washed with a little ether, and the filtrate is either distilled to recover the ether, or evaporated spontaneously, and finally by the aid of a water-bath until the odor of ether has disappeared. Good storax yields 70 to 75 per ct. of purified product. This process is also much to be preferred to the purification with hot alcohol.—Amer. Jour. Phar.. May 1883, 273, from Phar. Zeitung, 1883, No. 22.

Benzoin and Styrax—Comparative Value in the Preservation of Ointments.—Mr. Benjamin Franklin Scholl has experimented with tincture of benzoin and tincture of styrax prepared of the same strength, and finds that the latter tincture will answer well as a preservative for ointments, if the latter are to be used within two or three months, but that the preservative action of tincture of benzoin is more permanent.—Amer. Jour. Phar., Feb. 1883, 88.

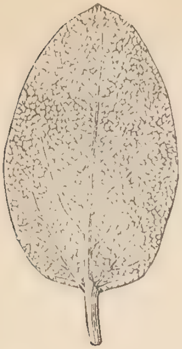
Alstonia Scholaris, R. Br.—*Production of a Caoutchouc-like Substance from the Milky Juice.*—Dr. W. C. Ondaatje draws attention to the fact that the milky juice of this tree is capable of being worked into gutta percha, or rather a substance possessing all of its properties. Attention had already been drawn to this fact by the author as early as 1865, but it seems to have escaped further notice.—Phar. Jour. Trans., April 7, 1883, 819.

ERICACEÆ.

Gaultheria Procumbens—Yield of Volatile Oil.—See *Volatile Oils* under "Organic Chemistry."

Arctostaphylos Glauca, Lind.—(*Manzanita*).—According to Dr. J. Mœller, the leaves (Fig. 30) are elliptic or ovate, 25 to 40 millimeters long, 15 to 25 millimeters broad, short petiolate, mucronate, leathery, the margin slightly thickened, smooth, pale green, one-nerved, the secondary nerves not prominent and with marginal termination, both surfaces delicately and evenly netted-wrinkled, inodorous, astringent and bitter. Dr. Mœller describes the vascular bundles (Fig. 31) as being of an interesting structure, not roundish, but linear on cross-section, the bast layers, however, not extending to the epidermis, but ending with a stratum of collenchyma tissue, which spreads under the epidermis and often extends to the collenchyma of the adjoining vascular bundle. The parenchyma contains iron-bluing tannin.—Amer. Jour. Phar., Oct. 1882, 514, from Phar. Centralh. 1882, 355.

FIG. 30.



Manzanita Leaf.

FIG. 31.

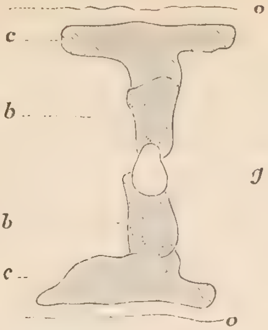


Diagram of Transverse Section:
o Epidermis, *g* Centre of fibro-vascular bundle, *b* Bast bundle, *c* Collenchyme.

Andromeda Japonica—Poisonous Constituents.—Professor J. F. Eykman has extracted from the fresh leaves of this plant—which is grown everywhere upon the mountains in Japan, is an evergreen, and is commonly regarded as poisonous by the Japanese—a toxic glucoside for which he has chosen the name

Asebotoxin.—It is a colorless substance, soft while moist, but brittle and transparent when dried at a gentle heat. When covered with water it cakes together, becomes soft below 100° C. but does not melt until the temperature 120° C. is reached, and then forms a transparent, light-brown mass. It is only slightly soluble in cold, more readily in hot water, and very easily in alcohol, amylic alcohol, glacialacetic acid, and chloroform, forming neutral solutions. It is readily soluble also in ether mixed with alcohol, but only very sparingly in pure ether, and very sparingly or not at all in petroleum ether, benzol, and bisulphide of carbon. It is tolerably soluble in water of ammonia, less so in solution of soda. Its aqueous solution is precipitated by basic acetate of lead, but not by neutral acetate of lead, nor by ferric chloride, cupric sulphate, mercuric chloride, chloride of gold, or nitrate of silver. It exhibits some fine color reactions: a magnificient blue color if strong hydrochloric acid is added to its alcoholic solution on a watch glass, accompanied by a peculiar odor resembling that of spiræa ulmaria. This blue color, under various conditions, changes to violet-red or reddish-gray. Concentrated sulphuric acid dissolves the glucoside with a red color, becoming fine rose-red on standing, with separation of a bluish-grey substance. Asebotoxin is fatal to rabbits when administered hypodermically in doses of 3 milligrams for each kilogram of the animal.—New Rem., Oct. 1882, 290–291.

Andromeda Japonica, Thunberg—*Isolation of Poisonous Principle.*—A poisonous principle, named *andromedin,* has been isolated from this plant by P. C. Plugge; it is resinous. nearly insoluble in petroleum-benzin, absolute ether and carbon bisulphide, slightly soluble in benzol.

glycerin and oil of turpentine. soluble in water, and freely soluble in chloroform, alcohol, amyl-alcohol, glacial acetic acid, and alkalies; its aqueous solution has a faint acid reaction, and is not precipitated by lead acetate or subacetate.—Archiv d. Phar., 1883, Jan., p. 1–16.

Probably the same principle, which, however, yields a flocculent precipitate with lead subacetate, has been named *asebotoxin* by J. F. Eijkman, and is obtained by agitating the concentrated aqueous infusion of the plant with chloroform, precipitating the chloroformic solution with petroleum-benzin, and purifying the precipitate by dissolving in alcoholic ether, agitating with water, and evaporating the latter solution. Asebotoxin is colorless. glass-like, soft at 100° C., melts at 120°, is freely soluble in warm water, in alcohol, chloroform, and amylic-alcohol, and less freely soluble in potassa solution than in ammonia and pure acetic acid. It is slightly soluble in pure ether, and almost insoluble in benzol, petroleum-benzin and carbon bisulphide. The aqueous solution has a neutral reaction, and is not precipitated by ferric chloride, cupric sulphate, mercuric chloride, auric chloride, argentic nitrate, or plumbic acetate. When boiled with diluted hydrochloric acid, a resinous body separates, and the filtrate yields, with alkaline copper solution, a copious precipitate of cuprous hydrate. Asebotoxin acquires a beautiful blue color when moistened with hydrochloric acid, the color changing to violet-red when heated in a water-bath. Diluted sulphuric acid colors it red, changing to rose-color, at the same time separating a bluish-gray substance. The lethal dose for rabbits is .003 gm. of asebotoxin or an infusion of .2 gm. of the leaves.—Chem. Centralbl., 1883, p. 72; Phar. Weekblad, Oct. 1, 1882.

The leaves of *Andromeda mariana*, Lin., known as stagger-bush, of *Kalmia angustifolia*, Lin., known as lamb-kill, and of several allied American species, are reported to be poisonous, and may contain a principle identical with or allied to the foregoing.—Amer. Jour. Phar., April 1883, 197.

In continuation of his previously published experiments, Prof. Eijkman has separated from *Andromeda japonica*, Thunberg, a glucoside distinct from asebotoxin, which he has named asebotin.

Asebotin forms colorless needles, which are but slightly soluble in water, but easily soluble in hot or boiling water; petroleum-ether, benzol, chloroform and absolute ether dissolve it but slightly. The aqueous solution has a very bitter taste. In alcohol, also in absolute, and in glacial acetic acid, it is very readily soluble. It is also more or less soluble in a mixture of alcohol and ether, according to the proportion of the solvents. It has a neutral reaction, and is not precipitated by metallic salts in an aqueous solution. Basic acetate of lead, however, produces a white cloudiness. Some experiments on its solubility, at ordinary temperature, gave the following results:

1 part in 2,000–2,500 of water
1 " " 6,000–6,600 " absolute ether
1 " " 25,000 " chloroform.

Its melting point was found to be 147.5° C. (uncorrected), and its specific gravity 1.356 at 16° C. It does not appear to be poisonous, when injected hypodermically in doses of 5 milligrams ($\frac{1}{12}$ grain). It is soluble in dilute alkalies. In these solutions, which acquire a brownish yellow color on exposure to air, bromine produces a bright yellow precipitate, which changes, on the addition of an excess of the reagent, to an amorphous substance very soluble in chloroform and in ether, and rapidly becoming bright red. If asebotin be evaporated with nitric acid, a yellow residue is left, soluble in water, and affording distinct reactions of oxalic acid. In a moist, ammoniacal atmosphere the crystals, after being moistened with water, assume a red-brown color. When dried at 100° C., they do not appear to lose any water of crystallization.

Asebotin does not reduce alkaline copper solution on boiling, except after being previously boiled with a dilute mineral acid. In this case, a crystalline substance, *asebogenin*, is separated, which has a light greenish tint, and which may easily be obtained in fine, colorless needles by solution in alcohol and precipitation with water.

Asebogenin forms colorless, fine needles which are insoluble, or nearly so, in cold as well as in boiling water. In alcohol and in ether, also when absolute, and in alkalies, it is quite soluble. It is odorless and tasteless, has a neutral reaction, and yields a white precipitate with basic acetate of lead.

Asebotin was found to have a composition corresponding to the formula $C_{24}H_{28}O_{12}$, Asebogenin has the composition $C_{18}H_{18}O_7$, and it is probably formed according to the following equation:

$$\underset{\text{asebotin}}{C_{24}H_{28}O_{12}} + H_2O = \underset{\text{asebogenin}}{C_{18}H_{18}O_7} + \underset{\text{glucose.}}{C_6H_{12}O_6}$$

According to this equation, 100 parts of asebotin should yield 68.1% of asebogenin and 35.4% of glucose. In my experiment, I obtained from 1.427 gm. of asebotin 0.941 gm. or 65.9% of asebogenin.—New Rem., Mar. 1883, 66.

COMPOSITÆ.

Persian Insect Flower—Cultivation.—Mr. Peter Henderson says that the plants of *Pyrethrum roseum* are easily raised from seeds and cuttings. In France, according to Willemot, a fresh, dry, rather silicious soil is preferred, with a southern exposure. The seed is planted from March to April (even in February, if the weather permits), lightly covered, pressed down, and rolled. It must be wet every five or six days, and transplanted when the plants are large enough, and placed six inches apart. They blossom from May to September in the second season.—New Rem., Jan. 1883, 14.

Insect Powder—Color, etc.—Mr. M. Conroy draws attention to the fact that much of the ground Insect Powder imported into England is colored, and that it chiefly has a bright yellow color, such as English grinders find it impossible by any legitimate means to match. The imported flowers are commercially known as "closed," "half-open," and "open" flowers, the first-named being regarded most active. A further distinction is caused by the circumstance that the flowers are now largely cultivated, so that now both wild and cultivated flowers are offered. The wild flowers are more esteemed, and are doubtless more energetic in their action.—Phar. Jour. Trans., April 21, 1883, 869.

Mr. W. L. Howie has subjected numerous samples of commercial Insect Powder, sold as pure, to examination. He finds the bright-colored powder to be generally adulterated either with chrome yellow or turmeric, or both, and thinks it quite probable that the adulterant is not simply confined to the coloring matter. The results of the examination of twelve samples is given by the author as follows:

Number.	Vendor's Definition.	Color.	Adulterant.
1	"Insect Powder"	Drab	Genuine.
2	" "	"	"
3	Powdered by the author	Olive drab	"
4	"From closed flowers"	Yellowish	"
5	"All closed flowers"	"	"
6	"Open flowers"	"	"
7	Packet Powder.	Yellow	Chrome.
8	" "	"	"
9	"Opt"	"	"
10	"All closed flowers"	"	Turmeric and chrome.
11	"Foreign"	"	Chrome.
12	"Dalmatian"	Very yellow.	Turmeric.

These results show that appearance is some indication of genuineness.—Ibid., May 19, 1883, 939–940.

Arnica Flowers—Falsification.—Ch. Ménier has examined a commercial sample of what was offered as arnica flowers, and was found to consist altogether of the flowers of *Inula britannica*, Lin. When seen in bulk these flowers somewhat resemble those of arnica, but the two may be readily distinguished by the following characters:

Arnica Montana.	*Inula Britannica.*
Heads, large, single.	Heads smaller, 2 or 3 in a lax corymb.
Involucral scales 16 or 18, equal, imbricated in two rows, lanceolate, hairy.	Involucral scales equal, narrow, linear, long-pointed.
Receptacle finely alveolate, chaffy.	Receptacle flat, naked.
Ligules, orange-yellow, with 9 to 11 veins.	Ligules yellow, 4-veined.

Arnica Montana.	*Inula Britannica.*
Anthers naked at base.	Anthers with two filiform appendanges at the base.
Akenes brown, stiff hairy.	Akenes hairy.
Odor characteristic.	Odor, none, or very feeble.

This substitution appears to have been practiced for a long time, and not unfrequently the flowers of the two plants may be found mixed.

Inula Dysenterica, Lin., which resembles the above species, is distinguished by its double pappus, the outer row being very short, coroniform, toothed, or split to the base, and by its slightly alveolate but otherwise naked receptacle.—Amer. Jour. Phar., Sept. 1882, 458, from Jour. Phar. et Chim., June 1882, pp. 611–612.

Chamomile—Value in Infantile Diarrhœa.—Christopher Eliot, M. D., writes, in "The Practitioner" of December, 1882, that he now seldom employs any other remedy than infusion of chamomile (*Anthemis nobilis*) in infantile diarrhœa. It is especially useful for the diarrhœa occurring during dentition, when the stools are many in number, green or slimy, and streaked with blood. Pain or cramp especially indicates its use, and a few doses will quickly calm a fretful child. ℥ ss. to ℥ j. of the infusion may be given to a child under one year of age, or double that quantity to a child over that age, and it may be repeated thrice or oftener daily according to the severity of the case.—New Rem., Mar. 1883, 88.

Tarchonanthus Camphoratus—Presence of a Peculiar Alcohol in the Leaves.—The leaves of Tarchonanthus camphoratus yield to hot alcohol a crystalline substance which, after washing with cold alcohol and recrystallizing, was found by F. Canzoneri and G. Spica to have a silvery lustre, to melt at 82°, solidify at a slightly lower temperature, and afterwards melt at 72° C. It is tasteless, insoluble in water, freely soluble in hot but sparingly soluble in cold alcohol, resists the action of acids and alkalies, and burns, giving off the odor of wax. It is probably a homologue of myricyl alcohol, and contains 50 or more atoms of carbon. The authors call it *tarconyl alcohol.* Alcohol takes also up a heavy dark-colored oil, having a pungent taste, and consisting mostly of an ether of an aromatic acid. The plant is indigenous to Southern Africa.—Amer. Jour. Phar., Dec. 1882, 625, from Gazzetta, 1882, p. 227.

Vernonia Anthelmintica, Willd.—*Uses as an Anthelmintic in Ceylon.*—Dr. W. C. Ondaatje states that this plant is cultivated by the Cinghalese and is in great repute as an anthelmintic, the powdered seeds being given to adults in doses of from ½ to 1 drachm, for expelling ascaris lumbricoides, etc. They are black, and have a bitter and nauseous taste.—Phar. Jour. Trans., April 7, 1883, 819.

RUBIACEÆ.

Cinchona—Cultivation in Jamaica.—Mr. D. Morris gives a description of six specimens of cinchona bark, which, together with specimens of leaves, flower, fruit and seed, were sent to the Pharmaceutical Society of Great Britain from the Government Plantations in Jamaica. The trunk bark of three of these specimens had previously been subjected to analysis by Mr. John Eliot Howard, and proved to be very valuable. The first, the bark of *Cinchona officinalis*, was taken from a tree about nine years old, growing at an elevation of 5,500 feet. It was determined to contain:

Quinine alkaloid	5.18	= Quinine Sulphate	6.95
Cinchonidine	0.22		
Cinchonine	0.01		
Quininidine	0.15		

The second specimen examined was the trunk bark of a

Cinchona hybrid, supposed by Mr. Morris to be a hybrid from between *C. succirubra* and *C. officinalis*. Mr. Howard found this excellent bark to resemble true *C. officinalis*, var. *Uritusinga*, and questions that it is a hybrid; but Mr. Morris maintains that it is a hybrid, and observes that although in single specimens of leaves, flowers, etc., it is almost impossible to decide its hybridity, yet on the plantation, where all gradations may be distinguished from among these trees, from almost the pure *succirubra* type to almost the pure *officinalis*, there can be no doubt of the origin of the specimen. Mr. Howard's analysis is as follows:

Quinine alkaloid	6.00	= Quinine Sulphate	8.00
Cinchonidine	0.73		
Cinchonine	0.10		
Quininidine	0.03		

The third specimen of trunk bark examined by Mr. Howard was that of

Cinchona Calisaya.—The trees were from 9 to 10 feet high at 5 to 6 years old, and were formerly included under *Cinchona officinalis*. Analysis gave the following results:

Quinine alkaloid	3.70	= Quinine Sulphate	4.93
Cinchonidine	0.60		
Cinchonine	0.35		
Quininidine	0.05		

—Phar. Jour. Trans., Mar. 31, 1883, 802–803.

Dr. B. H. Paul has subjected corresponding samples of Cinchona bark grown in Jamaica to analysis, with the results given below. He accounts for the discrepancies between his results and those of Mr. Howard by the fact that the samples analyzed by Mr. Howard (two years ago) were specially selected samples of the richest part of the lower trunk, while those recently presented to the Museum of the Pharm. Society are a fairer average representation of the bark product for sale in Jamaica.

Variety of Plant.	Kind of Bark.	Quinine . . .	Quinidine . .	Cinchonidine .	Cinchonine . .	Amorphous . .	Total . . .
1 Cinchona officinalis . . .	Trunk .	3.74	0.04	1.77	0.23	0.30	6.08
	Twig . .	1.08	trace	.37	.60	.20	2.25
	Root . .	2.90	1.01	.67	4.60	.58	9.76
2 Cinchona succirubra . . .	Trunk .	2.04	.13	2.58	2.45	.50	7.70
	Twig . .	.78	. . .	.47	.23	.29	1.77
	Root . .	1.76	.34	1.39	4.40	.90	8.79
3 Hybrid ?	Trunk .	2.47	. . .	2.24	.90	.52	6.13
	Twig . .	1.00	. . .	.87	.40	.36	2.63
	Root . .	2.45	.57	2.02	3.54	.56	9.14
4 Cinchona Calisaya . . .	Trunk .	.34	.23	.82	.82	1.80	4.01
	Twig . .	. . .	. . .	. . .	. . .	. . .	1.30
	Root . .	trace	4.07	.45	1.80	.65	6.97
5 Cinchona micrantha . . .	Trunk .	1.13	.30	.67	3.24	.68	6.02
	Twig . .	.43	. . .	.28	.60	.50	1.81

In the way of comparison the author republishes some results of analyses made by him in 1878 of some of the first samples of bark brought from Jamaica, which show that in most instances there has been an improvement in the quality of the bark.—Phar. Jour. Trans., May 5, 1883, 897.

Cinchona Bark—Best Process of Assay.—Dr. J. E. De Vrij has experimented with the process of Prollius (see Proceedings, 1882, 204) for the assay of cinchona bark, and finds that, with certain modifications, it must be regarded as the best process so far known. Although he believes that it would be better to saturate an alcohol of ninety-two to ninety-six per cent. with ammonia gas, and add the ether to this alcohol, he has used the mixture proposed by Prollius, viz.: Ether, 88 parts; water of ammonia, 4 parts, and alcohol, 8 parts, with success. He believes, however, that the proportion of this solvent to bark is not sufficient, and proposes 20 instead of 10 parts, carrying out the new process as follows: Put 10 or 20 grams of powdered cinchona in a glass-stoppered bottle. If the bark contains more than 40 grams of alkaloids per kilo, 10 grams of bark is enough; if less, 20 grams should be used. The bottle having been tared, add for every 1 part of bark 20 parts of the above ethereal liquid —either 200 or 400 grams, as the case may be—and agitate the mixture occasionally for an hour, which time, experience proves, is sufficient to cause the alkaloids to pass into the liquid, even those that are little soluble in ether under ordinary conditions. The flask is now replaced on the balance, in order to ascertain whether any loss has taken place. If not, as much of the liquid as possible is decanted; on replacing the flask on the balance, and ascertaining the loss of weight, the latter represents the amount of liquid poured out. Having used 200 grams of liquid and 10 grams of powdered bark, the author was able to pour off 159.8 grams, which, of course, represented $\frac{159.8}{200}$ of all the alkaloids contained in the whole liquid. The dried residue from this weighed 0.78 gram, hence the total quantity of crude alkaloid for 200 grams of liquid (= 10 grams of bark) was 0.9762 gram. In order to ascertain the quantity of pure alkaloid, the crude substance is divided in dilute hydrochloric acid, the solution filtered, the filtrate and washings agitated with caustic soda and chloroform, and the chloroform solution distilled to dryness and heated to constant weight. The amount of pure alkaloid thus obtained from 0.78 gram of crude alkaloid was 0.648 gram; hence the 10 grams of bark contained 0.811 gram of pure alkaloids, or 81.19 grams per kilo. For pharmaceutical purposes, further experiments may establish a percentage of impurity, which, deducted from the quantity of crude alkaloids found, will give the quantity of pure alkaloids in the sample with sufficient correctness.—New Rem., Sept. 1882, 258, from Jour. de Phar. et de Chim.

Peruvian Bark—Easy Method of Assay.—Dr. J. E. De Vrij has written very favorably of a process for determining the amount of alkaloids in cinchona, which depends chiefly upon the facts that they are dissolved out by means of a mixture consisting of ether, 88 parts; solution of ammonia, 4 parts, and alcohol, 8 parts. After maceration and separation, the solution is evaporated to dryness, leaving the crude alkaloids, which are purified by solution in acidulated water, filtration and precipitation by means of an alkali, and resolution in chloroform, which upon evaporation leaves the alkaloids pure. This process is improved, and made a very easy method of assay, by Mr. R. F. Fairthorne, as follows: 400 grains of the bark in moderately fine powder are boiled for ten minutes with 5 fluidounces of water acidulated with ¾ drachm of muriatic acid; when cool, the liquid portion is filtered through absorbent cotton placed in the neck of a funnel, into which the powder having been transferred is rather tightly pressed, and two fluidounces of water poured on and allowed to percolate. This is added to the filtrate, and the powdered cinchona again boiled with five fluidounces of water acidulated with 30 minims of hydrochloric acid. This decoction is filtered in the same manner as the first, using the same funnel and cotton. The bark is then thoroughly exhausted by percolation with acidulated water, the acid used being muriatic in the proportion of five minims to the fluidounce. It required about five fiuidounces to accomplish this. All the filtrates are now mixed and then refiltered through absorbent cotton. The filtrate is next thoroughly agitated with six fluidrachms of chloroform. When the chloroform has subsided, the supernatant liquid is drawn off and the last portions carefully collected by means of a pipette. This operation is repeated with six more fluidrachms of chloroform. To the acid decoction is added solution of soda so as to render it strongly alkaline, and to this one and a half fluidounce of chloroform and well shaken. The latter having been removed to a tared capsule, the decoction is again agitated with six more fluidrachms of chloroform. This having been separated, is poured into the capsule with the other portion of chloroform and allowed to evaporate at a moderate temperature. This leaves the alkaloids in a comparatively pure state, which weighed 16.20 grains. By following De Vrij's process, the alkaloidal residue weighs 16 grains.—Am. Jour. Phar., Nov. 1882, 548–550.

Cinchona—Selection for Medicinal Use and Process of Assay.—Mr. R. W. Giles discusses the causes of the gradual disuse of pharmaceutical preparations of cinchona, and attributes them mainly to the deterioration of Calisaya bark, which it is almost impossible to procure of pharmacopœial quality. He is of the opinion that barks meeting all the requirements of medicine are readily obtainable, and that the whole question may be narrowed down to this: "What standard should be adopted for the cinchona of pharmacy?" which may be answered as follows:

First. It should be an alkaloidal standard, not a quinine standard.

Secondly. It should be a mean and not an extreme standard.

And thirdly. It should be catholic, admitting barks from all sources, without arbitrary geographical distinctions, which, originally intended as definitions, have now become irrational limitations.

In pursuit of a test, or assay method, which shall be easy of execution, so that pharmacists may be induced to make their own assays of cinchona, the author has decided upon the following, which he tried at the recommendation of Dr. De Vrij:

Take 25 grams of finely powdered cinchona bark, mix with 2.5 cc. strong hydrochloric acid (= 2.6 cc. B. P. strength) in 30 cc. distilled water, or just so much as suffices to moisten the bark; set by for two hours, add 100 cc. distilled water and let stand for twelve hours more, stirring occasionally until all foam disappears from the surface. Pour into a cylindrical glass percolator, the mouth of which has been stopped by a pinch of charpie loosely dropped into it and moistened with a little water, and recover the clear percolate. Pour on more water until the percolate ceases to be precipitated by caustic soda. In this way about 300 cc. are recovered. Precipitate with caustic soda in considerable excess. Set the mixture by for twelve hours, when it will be found that the alkaloids have settled in a compact coherent stratum, from which the whole of the supernatant may be decanted. The decantate must be reserved. The precipitate is then poured on a filter, and washed with a little weak solution of soda to remove traces of cinchona red; finally it is washed with a little distilled water, the whole of the washings being added to the decantate, and the measure noted. When the precipitate has drained, it is carefully transferred to a tared porcelain dish, dried over a water-bath, and weighed. The weight should not be less than 1.25 grams, corresponding to 5 per cent. mixed alkaloids. But this will not be an exact indication of the alkaloids contained in the bark, as an appreciable quantity remains dissolved in the mother liquor. Practically this may be estimated as 0.05 gram in 100 cc., which should be added to the ascertained weight of the precipitate, and the sum multiplied by 4 gives a very close approximation to the true percentage—quite near enough for pharmaceutical purposes. When greater accuracy is required, the alkaloid retained by the mother liquor may be extracted with benzol, etc.

The merit of the above process is its simplicity and facility of manipulation; the several stages may be set going as opportunity offers, and they proceed automatically without withdrawing the operator from other duties. Secondly, the results correspond with the amount of alkaloids which can be extracted in practical operations. The author has found on an average 4.7 per cent. of alkaloid in 93 lots of Java bark offered by the Dutch Government during 1881—the highest being 9.8 per cent., the lowest 1.2 per cent., giving a mean of 5.5 per cent. The mean of the two results is, therefore, 5.1 per cent., which he evidently believes should be adopted as the standard for cinchona bark to be used in pharmacy.—Yearbook of Pharm., 1882, 488–494.

Red Cinchona Bark—Effect of Altitude on the Alkaloid.—The attention of Mr. J. E. Howard having been called to the effect of altitude on the character of cinchona bark, he has subjected specimens of *Cinchona succirubra* bark grown at different altitudes in Jamaica and in Ceylon, and subjected by Dr. Trimen and by Dr. Morris, to chemical examination, with the following interesting results:

Sample . .	Elevation above sea level.	Place of Growth.	Quinine . .	Cinchonidine.	Cchinonine .	Quinidine .	Amorphous .	Total . . .
A.	5500 feet . . .	Hakgala .	2.06	3.47	0.61	Traces.	0.66	6.80
	5500 to 6000 feet	Jamaica . .	1.70	3.17	0.75	. . . .	0.75	6.43
	2400 feet . . .	Jamaica . .	1.50	0.86	3.06	0.06	1.13	6.61
B.	1500 feet . . .	Peradeniya .	0.47	0.05	1.67	0.30	1.06	3.55

The samples designated A and B were sent by Dr. Henry Trimen, whose interesting communication on the above observations, to the Ceylon "Observer," April 9, 1883, is appended to Mr. Howard's paper. Mr Howard observes that, as in the barks from India, that from the lower elevations has the best appearance, whilst that from the higher elevations, as is shown by the analyses, has the richer produce.—Phar. Jour. Trans., June 9, 1883, 1013–1015.

Cinchona Leaves—Analysis.—Emil Happersberger has determined the amount of alkaloids contained in the leaves of four species of cinchona grown in the University grounds at Berkeley, California, which is declared to be a most unfavorable locality for the cultivation of the plant. The results were as follows:

Process.	Cinchona Calisaya.			Entire leaf.		
	Lamina without midrib.	Entire leaf.	Midrib.	C. succirubra.	C. officinalis	Hybrid.
Br. Phar . .	.70	2.0	3.2	1.5	.50	.75
Muter's. . .	.76	2.0	4.0	1.8	.66	.70

The alkaloids of calisaya leaves were separated, and consisted of quinine, quinidine, cinchonine, and cinchonidine, of which quinidine comprised about one-half of the whole. If these leaves are a fair representation of cinchona leaves generally, they must possess considerable medicinal value.—Amer. Jour. Phar., April 1883, 197, from Proc. Cal. Coll. Phar., 1883, p. 53.

Cuprea Bark—Formation of Caffeic Acid by the Splitting Up of One of its Components.—See *Caffeic Acid*, under "Organic Chemistry."

Hymenodictyon Excelsum—Alkaloidal Character of Bitter Principle.—Mr. W. A. H. Naylor has subjected the bitter bark of this plant, in common use among the natives of India as a tonic, to examination, with a view to determining the character of its bitter constituent. He found this *not to be æsculin*, as had been found by Mr. Broughton (1870), but to be a well-defined alkaloidal principle, allied to quinoidine, berberine and paricine. From *quinoidine* it differs in being optically inactive, and from its double compound in containing relatively less platinum. From *berberine* it differs in that it contains a higher percentage of carbon, while its double compound also yields a relatively larger amount of platinum. From *paricine* it differs alone in the percentage of hydrogen. The method pursued for its isolation is given. The author found it present to the amount of 1.75 per cent., and obtained besides 2.5 per cent. of a waxy substance. Phar. Jour. Trans., April 7, 1883, 817–818.

Randia Dumetorum, Lam.—*Medicinal Use in Ceylon.*—According to Surgeon W. C. Ondaatje, the seeds of this tree are used by the natives of Ceylon and India as a reliable agent in producing emesis. The author has seen the powdered seeds used with as good effect as ipecacuanha in doses of 5 to 10 grains, and he regards it, therefore, as a possible substitute for the more expensive Brazilian drug.—Phar. Jour. Trans., April 7, 1883, 818.

UMBELLIFERÆ.

Carrots—Fertility of the Colored Flowers.—Mr. Thomas Meehan observes that the umbellet of colored flowers in the centre of the umbel of the carrot is usually represented as fertile in Europe and sterile in the United States. He had also found them sterile here until 1882, when he discovered that those in the centre of the first umbel of the season were fertile, and those in the umbels from lateral shoots were sterile—Amer. Jour. Phar., April 1883, 163, from Proc. Acad. Nat. Science 1882, 221.

Laserpitium Latifolium—Examination and character of bitter principle, —*Laserpitin*, which see under "Organic Chemistry."

ARALIACEÆ.

Aralia Spinosa—Proximate Constituents.—In view of the differences in the results of former investigations of aralia bark, Josiah K. Lilly has undertaken to determine the nature of the principle to which the drug owes its aromatic odor, bitterish and acrid taste. The odor of the bark was found to be due to a *volatile oil* of a yellowish-green color, and obtainable in very small quantities by distillation with water. The bitter taste resides in an *amorphous extract-like mass*, soluble in ether, alcohol, and water, but insoluble in petroleum benzine, and remaining after the separation *a crystalline substance*, the exact nature of which has not been determined. The crystals had at first a saline taste, then developing a slight astringency, and are freely soluble in ether and alcohol, less so in water, and entirely volatilized at a red heat. The acrid principle is a *resin*, constituting a gray powder, preserving a strong and persistently acrid taste, insoluble in ether, but soluble in alcohol. It is associated with a *tasteless resin*, and *green coloring matter*, which are taken up by ether. A *saponin-like glucoside*, to which the property of frothing observed in infusions, decoctions, etc., is due, was also isolated, and is believed by the author to be a purer form of the yellowish substance described by Holden (see Proceedings, 1881, 168) under the name of *araliin*. The alkaloid announced by Elkin (loc. cit.) as existing in aralic bark, could not be found. Tannin also was not found.—Amer. Jour. Phar., Sept. 1882, 433–435.

RANUNCULACEÆ.

Aconitum Napellus—Proper Selection for Medical Use.—Mr. E. M. Holmes observes that aconite is not used in medicine (in Great Britain Rep.) to near the extent that might be supposed, and he is disposed to attribute this to the variability of the drug—roots as well as leaves—and of its preparations found in commerce. This variability is doubtless due to improper selection, since there are many varieties (De Candolle enumerates twenty-nine) of the officinal species, *Aconitum Napellus.* Although it is almost impossible to define accurately in botanical terms the different aconites, it seems worthy of inquiry whether those available for pharmaceutical purposes might not be characterized sufficiently for all practical purposes. Experimenting in this direction, the author found that the roots of several species did not cause a tingling sensation when chewed, and that this was the case not merely with the Asiatic species, *Aconitum uncinatum*, *heterophyllum* and *palmatum*, but that also several plants which present the specific characters of *A. Napellus*, although easily distinguished from it by habit, present the same peculiarity. Of these he mentions that those which were supplied to him under the names of *A. Napellus* var. *pyramidale* and *paniculatum*, etc., did not cause tingling when chewed, while others, such as *Stoerckianum* and *albiflorum*, produced slight, and others again, such as *A. autumnale*, a very powerful tingling sensation. But all of the aconites in which this variation occurs, so far as Mr. Holmes has observed, flower later than the typical *A. Napellus;* so that if the Pharmacopœia (British Rep.) added to its description, "the root obtained from plants flowering in May or June," and erased the words "imported from Germany," one cause of the unequal quality of the root would be removed. He believes that by limiting the official drug to home-grown aconite flowering in May and June, and gathered while the plant is in flower, it can be secured of uniform quality; and that even if the root were thus not gathered in its most active condition, it would have the advantage of uniformity of strength, which is of much more importance. In conclusion he observes, that aconite is very easy of cultivation, and considering the small quantity used, there is no reason why any chemist, who has a small piece of garden, should not grow his own aconite root. Yearbook of Pharm., 1882, 457–460.

Aconite—Proper Administration.—In the "London Medical Record," Dr. William Murrell makes some judicious observations on the correct plan for administering aconite so as to secure its most advantageous action. He observes that aconite does act best in small doses frequently repeated. Many practitioners get no good from aconite because they do not know how to use it. The dose of the tincture recommended in the British Pharmacopœia—from five to fifteen minims—is absurdly large, and no one with any regard for his patient's safety or his own reputation would ever think of giving it. The best way is to put half a drachm of the tincture in a four-ounce bottle of water, and to tell the patient to take a teaspoonful of this every ten minutes for the first hour, and after this hourly for some hours. Even smaller doses may be given in the case of children. The great indication for the use of aconite is elevation of temperature; the clinical thermometer and aconite bottle should go hand in hand. If properly used, aconite is one of the most valuable and indispensable drugs in the pharmacopœia.—Amer. Jour. Phar., Jan. 1883, 51, from Louisville Medical Review, Dec. 16, 1882.

Adonis Vernalis.—Extraction and Characters of Active Principle.—Dr. V. Cervello has subjected this plant to chemical investigation, and states that it contains only one active constituent, a glucoside, which he has named "adonidin." The quantity obtained is very small, but is probably all contained in the plant, since it is an extremely energetic compound, the physiological action of which is identical with that of digitalin. He also confirms the statement that it is not cumulative. For the preparation of adonidin, the plant is cut into small pieces, which are macerated during two days in 50 per cent. alcohol; the liquid is filtered, the filtrate treated with basic acetate of lead, filtered, and the filtrate evaporated on a water-bath to syrupy consistence. The syrupy liquid is rendered slightly alkaline with ammonia, and then heated with a strong solution of tannic acid, which is added as long as any precipitate is formed. The precipitate is collected on a filter, washed with a small quantity of water, and dried between paper. The tannic acid compound is decomposed by heating it on a water-bath with oxide of zinc and some alcohol, until the latter is evaporated, and the dry residue is then exhausted with strong alcohol. The impure solution of adonidin so obtained is evaporated to a small volume and ether added, when inactive colored matter is precipitated together with a trace of adonidin. Upon evaporation, and finally drying in a vacuum over sulphuric acid, pure adonidin remains. This is colorless, odorless, amorphous, non-nitrogenous, and extremely bitter; soluble in alcohol, but only slightly so in ether or in water. It is precipitated by tannic acid, the precipitate redissolving in much water. It is insoluble in dilute hydrochloric acid, but on being heated with the dilute acid it splits into sugar and a substance insoluble in ether, which, however, has not been nearer investigated.—Phar. Jour. Trans., Aug. 17, 1882, 129, from Arch. of Exper. Pathol. u. Pharmakol., xv. 235.

Delphinium Consolida, Lin.—*Separation of an Alkaloid.*—E. Masing obtained from 5 kilos of the dried flowering herb about 1 gram of alkaloid, for which he proposes the name *calcatripine*, derived from flores calcatripæ, under which name the flowers were formerly officinal. The alkaloid dissolved in one thousand parts of acidulated water, gave precipitates with the various group reagents for alkaloids; tannin yielded a faint turbidity after 24 hours; mercuric chloride, ammonium molybdate, and potassium bichromate, had no effect. Sulphuric acid, sp. gr. 1.84, gave a red-brown color, changing to violet brown, and after 24 hours to grey-brown. Fröhde's reagent colored olive green, becoming gradually deeper, then fading to grey yellow. Sugar and sulphuric acid gave a red-brown color, slowly changing to greenish blue. Sulphuric acid followed by nitric acid or a nitrate, causes the red-brown color to change to orange-red, then orange yellow, and finally golden yellow. The alkaloid, which was not quite pure, is soluble in alcohol, ether and chloroform, and appears to be easily decomposed by chemical agents.—Amer. Jour. Phar., May 1883, 265, from Phar. Zeitschr. Russ., 1883, W. 3.

Delphinium Ajacis—Insecticide and Therapeutic Value of the Flowers.—From his experiments with the acetic and aqueous infusion, Dr. Benvenuti draws the following conclusions: The flowers of the delphinium possess an insecticide action. They are to be preferred to other remedies of similar action on account of cheapness and absence of smell. They have a marked anæsthetic action, are excitant, rubefacient, astringent, and antizymotic. The author thinks this remedy has many points of resemblance to carbolic acid and iodoform.—Amer. Jour. Pharm., Jan. 1883, 50, from Giorn. Ital. delle Mal. Ven. e della Pelle, through Louisv. Med. News.

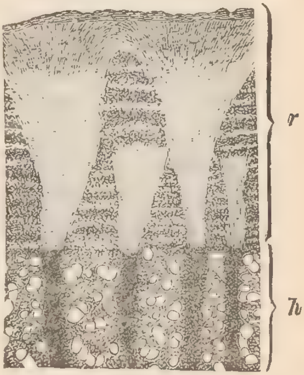
BERBERIDACEÆ.

Mahonia Aquifolia, De Cand. (*Berberis Aquifolia*, Pursh.)—*Microscopic Examination of the Root* (*stem*).—Dr. J. Moeller gives the following description:

The wood shows scarcely an indication of annual layers. The ducts are variable in size, rarely exceeding 0.1 mm., scattered, frequently several united tangentially, the terminal wall perforated, the lateral wall densely dotted and occasionally spirally striate; the wood parenchyma is scanty.

The young bark has no sclerotic cells; in older bark the parenchyma becomes thick-walled, forming layers resembling concentrically arranged bast layers; but bast fibres are entirely absent, and the parenchyma is short, rarely forming more than three layers. The primary medullary rays are composed of 10 or 15 rows of cells, and widen gradually to a layer of 1 mm. or more. Later on, secondary medullary rays are formed singly in each bark ray, and attain, centripetally, considerable width. The inner cell-groups of the medullary rays become sclerotic without changing size or shape. The middle bark consists of thin-walled, tangentially elongated parenchyma, and is covered by delicately flat-celled cork.

Fig. 32.



Mahonia Aquifolia, transverse section; *r*, bark; *h*, wood.

The parenchyma contains a golden yellow substance, soluble in water, while the sclerotic cells of the wood and bark retain the color. Berberine nitrate could not be obtained by Bödeker's micro-chemical reaction; only traces of calcium oxalate are present, and crystals are rarely observed; but sulphuric acid causes the separation of a few needles of calcium sulphate. Starch is absent, indicating that the root is collected in summer.—Am. Jour. Phar., Oct. 1882, p. 512, from Phar. Centralhalle, 1882, p. 356 and 357.

MENISPERMACEÆ.

Coscinium Fenestratum, Colebr.—*Antiseptic Properties.*—Dr. W. C. Ondaatje has observed that the stem of this plant, which is used in Ceylon as a tonic, has antiseptic properties. Pieces of beef, immersed in an infusion of the stem, were preserved for several weeks. He has used in Ceylon a weak infusion of the stem as a lotion for foul ulcers, with great success.—Phar. Jour. Trans., April 7, 1883, 818.

OCHNACEÆ.

Castella Nicholsoni—Proximate Analysis of the Root-bark.—Mr. J. L. Putegnat, Jr., after discussing the botanical relations of this plant, communicates the results of its proximate analysis. It is reputed to have antiseptic properties, which are probably due to a bitter principle, first isolated from the root-bark by Mr. J. L. Putegnat, Sr., and named by him

Amargosin, from "Amargosa," the common name of the plant. This principle is amorphous, resinous, partially soluble in water, soluble in alcohol and in ether. The following shows the results of the examination of the root-bark made by the author:

	Parts.
Ether dissolved	6.99
Alcohol dissolved	7.35
Cold water dissolved	5.72
Acidulated (H_2SO_4) water dissolved	2.75
Alkali (Na) solution dissolved	1.54
Insoluble substances	74.88
Lost and undetermined	0.77
	100.

Portion soluble in ether:

	Parts.	
Yields to water	0.30	of bitter principle.
" dilute acid (HCl)	0.12	"
" alcohol	1.41	"
" "	0.40	resin.
Insoluble substances	4.76	wax, coloring matter, chlorophyll.
	6.99	

Portion soluble in alcohol:

	Parts	
Yields to water	5.99	of bitter principle, organic acids, and coloring matter.
Insoluble substances	0.82	of bitter principle and resin.
"	0.54	of albuminous substances separated by heating water solution.
	7.35	

Portion soluble in cold water:

Chiefly albuminous substances, coloring matter, and gum.

Portion soluble in acidulated water:

	Parts.
Starch and isomers converted into glucose	1.71
Coloring matter, etc.	1.03
	2.74

Portion soluble in alkali solution:

Coloring matter, humus, and decomposition compounds.

The drug also contained:

Moisture	7.91 %
Ash	21.22 %

Ash Analysis.

	In 100 parts.
Sulphuric acid (SO_3)	0.84
Hydrochloric acid (Cl)	0.98
Soda (Na_2O)	6.77
Potash (K_2O)	32.95
Calcium (CaO)	46.09
Iron (Fe_2O_3)	1.50
Magnesia (MgO)	3.01
Clay and sand.	10.32
	102.46

The excess of 2.46 parts is due to the calculation of the bases as oxides.

—New Remedies, April 1883, 102–103.

RUTACEÆ.

Quassia Amara and Picræna Excelsa—Absence of Bitter Principle in Some Commercial Samples.—Yield of extract, and extraction and character of *quassin*, which see under "Organic Chemistry."

MALVACEÆ.

Gossypium Barbatense—Use of the Leaves.—According to Anderson, the leaves of this plant are used in Jamaica as a galactagogue, in the form of infusion, 6 or 8 leaves being used to the teacupful. The taste of the infusion is not unpleasant, and may be improved by the addition of milk and sugar. According to the effect produced, four teacupfuls or more are taken in 24 hours.—Amer. Jour. Phar., Dec. 1882, 595, from Arch. d. Phar., Oct. 1882, p. 762; Allg. Med. C. Ztg.

BÜTTNERACEÆ.

Sterculia Acuminata, Pal. de Bavois—*Proximate Analysis of the Seeds.*—Heckel and Schlagdenhauffen have submitted the cotyledons of the cola nut to analysis, with the following result. 100 parts were found to contain:

Caffeine	2.348	Substances soluble in chloroform.
Theobromine	0.023	
Tannin	0.027	
Fatty matter	0.585	
Tannin	1.591	Substances soluble in alcohol.
Cola red	1.290	
Glucose	2.875	
Fixed salts	0.070	
Starch	33.754	
Gum	3.040	
Coloring matter	2.561	
Protein substances	6.761	
Ash	3.325	
Water	11.919	
Cellulose	29.831	
	100.000	

This analysis shows that the cola nuts are richer in caffeine than the most esteemed varieties of coffee, and that this base is contained therein in a perfectly free state, not combined, as in the coffee, with an organic acid; they contain also an appreciable quantity of theobromine, which increases the properties of the caffeine and acts syngenetically with this active principle. It is also an important fact that they contain a notable quantity of glucose, of which cacao contains no trace; the quantity of starch is also thrice that contained in the seeds of theobroma, which explains their nutritive value; the amount of fatty matter, however, is very slight, compared with that contained in the cacao. There exists further a special variety of tannin, which resembles caffeo-tannic acid, and a red coloring matter (cola red) very closely related to that denominated by Payen as cacao red. The physiological examination of this seed has shown that its unique action depends upon the caffeine and theobromine which it contains. Am. Jour. Phar. July 1882, 358, from Rep. de Pharm., 1882, No. 4, p. 463.

Kola Nuts—A Substitute for Coffee.—Thomas Christy draws attention to the value of Kola nuts,

Sterculia acuminata, as a substitute for coffee, and expresses the opinion that a large European demand will soon exist. The nut is found to contain the same active principle as coffee, viz.: caffeine, and more of it than the best coffee, and to contain also the same active principle as cacao, but less fatty matter. Possessing the same qualities as these favorite beverages, it only needs proper treatment to develop a special flavor, and it would then probably be able to compete successfully with those beverages. The nuts are used to form a refreshing and invigorating drink throughout a large portion of tropical Africa, their use being said to support the strength, allay inordinate appetite, assuage thirst, and promote digestion, and to render those using them capable of prolonged fatigue. The negroes prefer them to tea or coffee, and when they can obtain Kola nuts, will not touch coffee. The author has recently been informed by Mr. Espeut, a well-known sugar planter of Jamaica, that the negroes use the Kola nut as a remedy for drunkenness; that swallowing a single nut, ground up and made into cream or paste with water or spirit, no sign of intoxication remains half-an-hour afterwards. Confirmatory evidence of this property in the Kola nut is given by a surgeon, Mr. Papefio, who states that alcoholic drinks do not produce intoxicating effects when the Kola nut is eaten at the same time.—Amer. Jour. Phar., Jan. 1883, 27–28, from Chemist's Jour.

TILIACEÆ.

Tilia Argentea, Desf.—*Uses in Greece as Tea Plants.*—Professor X. Landerer observes that the flowers, deprived of the leafy bracts, are sent from Macedonia and yield a tea of an agreeable taste, which is usually mixed with Hymethus or Thymari honey, collected near the Hymettus mountain, where the bees visit the flowers of Thymus (Satureja) Thymbra. In the ancient Hellenian times, Apollo was regarded as the protector of bees, and in the temple was adorned with a wreath of Thymbra. —Amer. Jour. Phar., Jan. 1883, 4.

AURANTIACEÆ.

Lime Juice—Properties, etc.—Mr. Michael Conroy has written an interesting paper on "Lime Juice: Its Properties and Uses," from which it appears that Montserrat lime juice is much superior to that produced in Jamaica and elsewhere, on account of the precautions taken in its preparation. Only sound and choice fruit is used, and being sliced, it is expressed in huge wooden presses, the juice being run at once into puncheons and quickly bunged up. Only about two-thirds of the juice contained in the fruit is expressed, thus ensuring greater freedom from mucilaginous and pulpy matter. The remainder of the juice, together with that of inferior fruit, is evaporated to the consistence of treacle, and sold to citric acid manufacturers. Lime juice contains citric acid, gum, sugar, albumen, extractive matter, inorganic salts, and water; but the quantity of sugar is only a mere trace, and it contains much less gum and albumen than does lemon juice, on which account it is much less liable to fermentation and decomposition than the latter. The question has been raised, whether lime and lemon juice required the addition of alcohol for their proper preservation. The author has kept samples of lime juice for 12 months, and found it to be entirely unchanged in the amount of citric acid. In his opinion it is, therefore, not necessary to add alcohol to lime-juice. On the other hand, he considers the quantity of proof spirit —15 per cent.—annually added to lemon juice to be insufficient, and that as much as 30 per cent. of proof spirit should be added. The filtration of lime juice he finds not only not necessary, but even objectionable, since the turbidity is due to suspended oil, the presence of which tends to the preservation of the juice. The author has determined the acidity in 4,160 puncheons of lime juice, and found an average of 7.84 per cent. citric acid. He also gives the percentage of 20 samples containing the largest, and 20 samples containing the lowest percentages, which show the first to vary from 9.45 to 10.05 per cent., the latter from 6.80 to 7.20 per cent.—Phar. Jour. Trans., Jan. 27, 1883, 606–608.

Orange Wine—Preparation.—A writer in the "Semi-tropic California" describes his experience in making orange wine from the wild orange of Florida years ago, and says it cannot be surpassed for medicinal purposes. The oranges must be perfectly ripe. Peel them and cut them in halves, crosswise of the cells; squeeze into a tub. The press must be so close that the seeds cannot pass into the must. Add two pounds of white sugar to each gallon of sour orange juice, or one pound to each gallon of the mixed sugar and juice. Close fermentation is necessary. The resultant wine is amber-colored, and tastes like dry hock, with the orange aroma. Vinegar can be made from the refuse, and extract from the peels.—New Rem., Nov. 1882, 333.

VITACEÆ.

Greek Wines—Increased Export.—According to Prof. K. Landerer, Greek wines are now extensively exported to all parts of Europe, in consequence of the devastation of numerous vineyards by the phylloxera, which thus far has not made its appearance in Greece. It is more particularly the volcanic island of Santorin where many wines are produced, closely resembling those of Spain, Sicily, Southern France and the Cape wines; these sweet wines are called vino santo. The concentrated, unfermented grape juice, known in Turkey as *betmese*, is now largely exported to Central Europe, where it is fermented with the juice of the native grapes, and thus employed for improving the more acidulous wines of more northern latitudes.—Amer. Jour. Phar, Jan. 1883–4.

Wine—Composition when Made from Unripe Grapes.—Wine made from unripe grapes was found by F. Musculus and C. Amthor to contain abnormally large proportions of extractive matter, acids, ash, and phosphoric acid, and a small amount of alcohol. The extractive is gelatinous, and probably contains pectin compounds. The authors conclude that during the ripening of the fruit the greater portion of the mineral constituents pass into the stem.—Amer. Jour. Phar., Dec. 1882, 627, from Zeitschr. Anal. Chem., xxi., 192.

Wine—Analysis.—J. Nessler and M. Barth contribute an exhaustive paper on the analysis of wines, embracing: 1. The determination of the amount of extract; 2. A modification of Neubauer's test for potato sugar in wine, and the optical behaviour of pure and saccharated wine; 3. The chlorine determination and the amount of chlorine in wine; 4. The detection of tartaric acid; and, 5. The determination of citric acid in wine.

—Phar. Jour. Trans., July 15, 1882, 43–46, from Zeitschr. Anal. Chem., xxi., 43.

Wine—Detection of Sulphurous Acid.—According to Mr. L. Liebermann, about 15 to 20 cc. of the wine are distilled; the distillate is diluted and shaken with a few drops of iodic acid and chloroform. The chloroform is colored violet from liberated iodine if sulphurous acid is present, whilst volatile organic acids and aldehydes do not reduce iodic acid under these circumstances. In this way it is possible to recognize sulphurous acid in 2 cc. of a solution containing 1 part in 500,000. Another method consists in oxidizing the sulphurous acid in the distillate to sulphuric acid. The distillate is treated with hydrochloric acid and chloride of barium, and then with nitric acid. Turbidity shows the presence of sulphurous acid in the sample.—Jour. Chem. Soc., Sept. 1882, 994, from Ber. d. Deutsch. Chem. Ges., 15, 439–441.

Red Wines—Detection of Two Coloring Substances.—According to Carl Amthor, for the recognition of *vegetable red* (rouge végétal), a substance belonging to the aniline dyes, 100 cubic centimetres of the red wine are evaporated in order to remove the alcohol, and after strongly acidulating with sulphuric acid shaken with ether, and the ether allowed to evaporate in a small porcelain capsule, together with a white woolen thread; the latter becomes of a fine brick-red color, by the addition of a drop of ammonia, transitorily violet, and then discolored; by the application of acetic ether, the wool assumes a fine rose-red color, and, on the addition of ammonia, violet. By agitating the wine with amylic alcohol, the latter is colored red as in the case of fuchsine; but while with the latter substance the red color disappears upon warming with ammonia, and is again produced upon acidulating with acetic acid, the red color imparted to amylic alcohol by vegetable red is changed to an evanescent violet by ammonia water. Upon agitation the coloring matter is withdrawn from the amylic alcohol, the latter becomes colorless, and the ammoniacal liquid assumes a brown-red or dark fire-red color; by the addition of acetic acid the liquid becomes almost completely decolorized. The red amylic alcohol solution leaves upon evaporation a fine red residue, which by ammonia vapors becomes transitorily violet. A red liquid known as "Teinte bordelaise," which has been introduced from France for the coloration of wine, was found to contain four per cent. by volume of alcohol, and to consist of the concentrated and fermented juice of the whortleberry.—Amer. Jour. Phar., May 1883, 262, from Chem. Ztg., No. 8, 1883, 109, and Rep. an. Chem. 2, 369.

Red Wines—Detection of Fuchsine.—It has been known for some time that red wine, shaken for some time with an equal weight of coarsely-powdered dioxide of manganese, loses its color. Facen originally stated that this only occurs in genuine red wines, but Wittstein showed that it also took place in wine colored with mallow flowers. P. Pastrovich now announces that the reaction may be used for detecting the presence of fuchsine, whether this be added merely to heighten the color of otherwise genuine red wine, or be the sole coloring matter present. Genuine red wine, when treated with dioxide of manganese, becomes almost colorless; so also wine which has been colored by elder and other berries, and by cochineal. If colored with logwood, brazil wood or archil, the tint changes to brownish-yellow. But if fuchsine is present, no change of color takes place, even on heating. The reaction is so delicate that two milligrams of fuchsine may easily be detected in a liter of the suspected wine.—New Rem., Mar. 1883, 81, from Ber. d. Deutsch. Chem. Ges., 1882, 808.

ERYTHROXYLACEÆ.

Coca—Power as an Assuager of Thirst.—Sir Joseph Fayrer has reported, through the "Medical Times," his experience in the use of coca leaves, chewed during mountain climbing, as a means of preventing or relieving thirst. His experiment consisted in the distribution of about eighty grains of the leaf to each one of the four guides and porters who accompanied him. During the ten hours consumed by the excursion, no water and but a limited quantity of wine were consumed. They drank no tea or coffee, nor did they use ice or snow. Nevertheless the chewing of the coca appeared to furnish great relief from thirst, and enable them to make the trip with comparative comfort.—New Rem., Nov. 1882, 342.

Sethia Acuminata, Arn.—*Vermifuge Properties.*—Dr. W. C. Ondaatje draws attention to this plant, the leaves of which are much used by the natives of Ceylon as a vermifuge. The juice of the leaves is mixed with sugar and castor oil, or with a powder of the leaves. The leaves are easily powdered when dried, possess the advantage of not having a disagreeable taste, and are given in doses of 10 to 15 grains when dried and powdered.—Phar. Jour. Trans., April 7, 1883, 818.

PAPAVERACEÆ.

Poppy—Cultivation in European Turkey.—The Turkish Government has distributed throughout the agricultural districts of Macedonia very complete instructions as to the cultivation of the poppy, and the method of extracting and preparing opium. A translation of this interesting document will be found in Phar. Jour. Trans., May 12, 1883, p. 918–920.

Poppy—Cultivation in Persia.—From a recent report on the trade of Persia it appears that, owing to the silkworm disease, the peasantry in Persia are directing their attention to other crops, and among them to the cultivation of the poppy. In Kermanshah, until ten years ago, the cultivation of opium was very limited, not exceeding 675 lbs. a year, required for local consumption. Last year's crop yielded about 13,500 lbs.

and it was expected that this year's would realize double that quantity; but it was affected by cold, and consequently did not realize more than 9,450 lbs. From Ispahan it is reported that this year's crop has been partially injured by cold, but that it is richer in juice than that of the preceding year. No change or improvement, it is stated, has taken place in the preparation of the drug, beyond a large admixture of oil introduced to suit the taste of the Chinese, the proportion being about 6 lbs. or 7 lbs. to each chest of 141 lbs. Very low prices were obtained in foreign markets for Persian opium last year, in consequence of which it is said by some that unless prices rise in China the poppy cultivation will not be further extended. The drug is prepared at Ispahan, Shiraz, and Yeza. After being dried in the sun it is manipulated. That destined for China is mixed with oil; that sent to London is exported in its pure state. Persian opium is reported to have lost in the estimation of the Chinese; from this it may be inferred that adulteration must have considerably increased. In Khorassan the cultivation of the poppy has increased tenfold within the last ten years. It grows everywhere, in cold as well as in hot districts; every landed proprietor cultivates it, and it may be said that one-eighth of the entire produce of Khorassan is poppy. In Yeza it seems that this year's crop suffered much from cold, resulting in the produce of about half last year's crop. The oil used for mixing with the drug destined for China is linseed oil.—New Rem., Mar. 1883, 76.

Opium—Cultivation in the Zambesi District.—During the past year Mr. P. Guyot made an exploration of the district about Chaima, near Mopea, about three and three-quarter miles from the Zambesi, and upon the banks of the Quaqua, where opium is now cultivated. In 1879 the fields were sown for the first time. In 1880 three hundred workmen were engaged. During this year forty-four hectares of ground were sown, and nearly twice that amount in 1881. The yield of opium, per hectare, was 55 to 60 kilos in 1880. The average yield in India is only about 50 kilos, and it takes about 120 days from the date of sowing until the harvest, whereas, in this district, the opium is collected after 75 days. The opium exhales a slight characteristic odor, but it is not placed on the market in the condition of viscid paste. To render it marketable, it is mixed with eighty per cent. (?!) of a special substance known only to the European employees, and then formed into balls weighing five hundred grains. These balls are carefully packed in boxes holding four hundred. In the bottom of the box is placed a layer of dust obtained by bruising the empty capsules and poppy leaves; upon this is placed a layer of native cotton, and on top of it the balls of opium, until the box is full.—New Rem., Jan. 1883, 15–16, from Compt. Rend., 1882, 798.

Bulgarian Opium—Description of Varieties.—The cultivation of the opium poppy in Bulgaria has been introduced under the auspices of the medical council and of the Secretary of the Treasury, the latter having distributed seeds as late as 1879. A. Teegarten reported in 1881 on the opium obtained in the Lowtscha district in 1880. Since that time several Macedonians who were practically acquainted with the preparation of opium were engaged, and the author now describes the following samples thus obtained:

Opium from Kuestendil is in hemispherical cakes, weighing from 120 to 300 gm. While still soft the opium is formed into balls, which are laid upon grapevine leaves and covered with the same leaves so as to leave the sides free. The cakes have an exceptionally strong narcotic opium odor, are externally brown, internally lighter, very dry (moisture 7.63 per cent.), and show upon the fractured surface a large number of small tears of the size of a millet grain to that of a lentil. The taste is very bitter; water takes up nearly two-thirds of the weight of the opium, yielding a clear brown solution of an acid reaction, and acquiring a dark red color with ferric chloride. The ash amounts to 2.69 per cent.

Opium from Lowtscha is in irregular oblong or quadrangular cakes, weighing 100 to 200 gm., and covered with green leaves; the tears upon the fracture are less distinct, and the powder is of a lighter color than the preceding. Moisture 10.39, ash 2.36 per cent.

Opium from Hatitz is in round, somewhat convex cakes, about 13 centimeters in diameter, and 2 centimeters thick near the centre. The cakes are covered with small leaves, and are of a rather light brown color; the aqueous solution is of a lighter color, has a less distinct acid reaction, and filters less readily, than the two preceding samples. Moisture 10.86, ash 2 85 per cent.

Calculated for dry opium, the different varieties yield for 100 parts:

	Kuestendil	Lowtscha.	Hatitz.
Ash	2.63	2.63	3.2
Morphine	20.73	13.28	8.13
Other principles soluble in water	47.54	50.58	40.85
Insoluble in water	31.73	36.14	51.02

—Am. Jour. Phar., Dec. 1882, 626, from Phar. Zeits. Russl., 1882, Oct. 3, 747–752.

Opium—Estimation.—The Paris Society of Pharmacy has agreed upon the following method for the valuation of opium: 15 grams of the opium to be tested are intimately mixed with 9 grams of calcium hydrate, 150 cubic centimeters of water gradually added with continued trituration' and the mixture occasionally agitated for half an hour. The mixture is then poured upon a filter, and exactly 100 cubic centimeters of the filtrate brought into a stoppered glass vessel. Twenty cubic centimeters of ether are now added and agitated, and, after dissolving 6 grams of powdered chloride of ammonium in the liquid, it is allowed to repose for two hours. The ether is then decanted, replaced by a fresh portion, and after repeated agitation again decanted. The precipitate of morphine is finally collected upon a smooth filter, washed with a few cubic centimetres of cold distilled water, dried and weighed. The weight of the dried precipitate, after deducting the weight of the filter, when multiplied by 10, represents the percentage amount of morphine in the opium.—Amer. Jour. Phar., Dec. 1882, 598, through Phar. Zeitung, No. 60, 1882, from Jour. de Pharm. d' Alsace-Lorraine.

CRUCIFERÆ.

Mustard—Method of Analysis.—Albert R. Leeds and Edgar Everhart review the process of Hassal for the analysis of mustard, and find that it is open to very serious objections. They have worked out the following method, which yields satisfactory results: The moisture and ash are determined as usual. The mustard oil is extracted with ether in the following manner: A weighed portion of mustard, after drying at 105°, is carefully brushed into a plaited filter. The filter and its contents are placed in a funnel with straight sides. The stem of the funnel is connected, by means of a well-fitting cork, with a small tared flask partially filled with ether, while the funnel itself is connected with an upright condenser. On cautiously boiling the ether, its vapor is constantly condensed; and, falling on the mustard, extracts the oil, which is retained in the flask. When all of the oil is removed, the ether is distilled off, and the flask and contents, after drying at 100°, reweighed. The difference between the weight of the flask alone, and that of the flask and oil, gives the amount of oil. After the ether has evaporated from the mustard residue, a tared flask, containing half water and half alcohol, is substituted for that containing ether, and the contents are boiled and condensed as before. The dilute alcohol dissolves both the sulphocyanide of sinapine and the myronate of potash, while it coagulates the myrosine, and leaves both it and the cellulose undissolved. After all the sulphocyanide of sinapine and myronate of potash have been extracted, the contents of the flask are rinsed into a tared platinum dish, evaporated to dryness, dried at 105°, and weighed. The dish and contents are then ignited and weighed. The difference of weight before and after ignition gives the total amount of sulphocyanide of sinapine and myronate of potash. Subtracting the amount of the later, the difference is the amount of sulphocyanide of sinapine.

After the extraction with alcohol, the filter contains only the myrosine and cellulose, together with a little coloring matter. The alcohol is allowed to evaporate spontaneously, and then the myrosine and cellulose are treated in the cold with a ½ per cent. soda solution. The solution containing the myrosine is decanted through a weighed filter, and the residue is treated again in the same manner. By this treatment all the myrosine is obtained in solution. The cellulose on the filter is dried, weighed, ignited, and the ash weighed. The difference between the two weights gives the cellulose.

The solution containing the myrosine is just neutralized with dilute hydrochloric acid, and about 50 cc. of Ritthausen's cupric sulphate solution added. The solution is then *exactly* neutralized with dilute soda, and the heavy green precipitate of the compound of copper and myrosine allowed to settle to the bottom of the beaker.

The precipitate is collected on a weighed filter and dried at 110°. After drying, the weight of the precipitate is taken. It is then ignited and the ash weighed, the difference giving the total amount of myrosine.

The amount of myronate of potash in the sample is determined by the method recommended by Hassal, and is as follows:

Forty or fifty grains of the mustard are allowed to digest for twenty-four hours, with about 250 cc. of water in a well-corked flask. At the end of that time all the myronate of potash will have been decomposed by the ferment myrosine into glucose, sulphate of potash, and mustard oil (allylthiocarbamide), according to the equation $C_{10}H_{18}KNS_2O_{10} = C_6H_{12}O_6 + KHSO_4 + C_4H_5NS$. The contents of the flask are distilled, and all of the allylthiocarbamide goes over with the water vapor. The end of the condenser dips below the surface of some strong ammonia water to prevent loss of the volatile oil. When no more oily drops come over with the distillate, the receiver and its contents are removed and allowed to stand until the allylthiocarbamide has combined with the ammonia, forming thiosinnamine ($C_4H_5NS.NH_3$). The solution is evaporated to dryness in a tared platinum dish, and from the amount of thiosinnamine found is calculated the myronate of potash.

The two following analyses of a sample of brown mustard farina, prepared by H. K. and F. B. Thurber & Co., New York, were made simultaneously. Afterwards a third analysis was made on the same sample.

Analysis of Brown Mustard Farina.

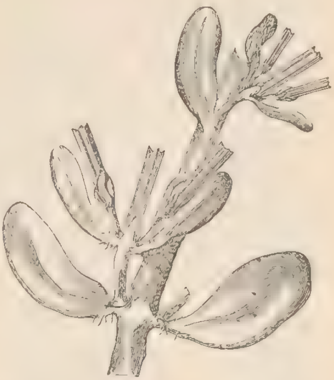
	1	*2*	*3*
Moisture	6.78	6.90	6.82
Myronate of potash	0.61	0.61	0.72
Sulphocyanide of sinapine	10.97	11.19	11.21
Myrosine	28.45	28.70	28.30
Mustard oil	29.22	29.21	29.19
Cellulose by difference	20.24	19.55	20.06
Ash	3.73	3.84	3.70
	100.00	100.00	100.00

—Amer. Jour. Phar., Aug. 1882, 404–407, from Jour. Amer. Chem. Soc., 1881, 130.

FRANKENIACEÆ.

Frankenia Grandifolia, Cham. and Schl. (*Velezia Latifolia*, Eschholtz). This drug is described by Dr. J. Moeller as follows: Stem terete, somewhat woody, little branched, about 15 centimeters (6 inches) high, leaves decussate, small, obtusely-ovate, or spatulate, the upper ones more linear, entire, one-nerved, fleshy. The young leaves and branch-tops are short-hairy, the older ones nearly smooth, sparsely hairy near the base, and slightly ciliate. The branches terminate with a flower, which has frequently two lateral flowers upon short branchlets, and an involucre formed from the last two pairs of leaves. The calyx is tubular, angular, four-ribbed and four-toothed; the petals are pale reddish, clawed, small. The dry herb is gray-green, inodorous, of a saline taste, due to an incrustation of salt; after washing it is tasteless.—Amer. Jour. Phar., Oct. 1882, 514, from Phar. Centralhalle, 1882, No. 30.

FIG. 33.



Branch of Frankenia grandifolia (natural size).

CUCURBITACEÆ.

Colocynth.—Preparation and character of *Colocynthin*, which see under "Organic Chemistry."

Megarrhiza Californica, Torrey—*Examination of Constituents.*—The root of this plant has been examined by J. P. Heaney (see Proceedings, 1877, p. 201). The bitter glucoside megarrhizin seems to have been recently obtained in a much purer state by Wilfred M. Young; its decomposition product, now named *megarrhizein*, was prepared in white feathery crystals, soluble in hot water, alcohol and chloroform, insoluble in ether and cold water; it is purgative in doses of ¼ grain.

Young found also a second glucoside in *megarrhin* which resembles saponin, and possesses the property of dilating the pupils; also two resins, one soluble in alcohol, the other soluble in ether.—Proc. Cal. Coll. Phar., 1883, p. 52.

MYRTACEÆ.

American Myrtles—Review of Useful Species.—Prof. John M. Maisch gives a brief account of those American species of the order Myrtaceæ, which yield useful or more or less medicinal products. It is noteworthy that while a large number of myrtles are indigenous to the West Indies, and also to South America, of the 1700 or 1800 species belonging to the order only a few are indigenous, but none are peculiar to the United

States. The five species enumerated in Chapman's Flora, are small trees confined to Southern Florida. Not a single myrtle has been found indigenous to California, though the climate is well suited for the growth of different species of Eucalyptus, and doubtless of other genera of this interesting and useful natural order. Amer. Jour. Phar., July 1882, 345, 352.

Myrtus Cheken—Analysis of Leaves and Stems.—Mr. Joseph Winters England, after referring to the character of the myrtaceæ in general, and to the botanical relations and histological character of this shrub in particular, communicates the method pursued in the analysis of the stems and leaves. The relative proportion of stems and leaves to each other by weight, was 1 to 1.84. Two separate analyses were made, with the following results:

STEMS.

1. Moisture	10 per cent.
2. Ash	4.84 per cent. chlorides, phosphates, sulphates and carbonates of potassium, magnesium, calcium, and aluminium; silica.
3. Volatile principles.	
4. Benzin extract	5.45 per cent. yellow color, fixed oil, fatty acid.
5. Alcoholic extract	6.25 per cent. resin, tannin, extractive.
6. Hydro-alcoholic extract	5.2 per cent. tannin, organic acid, extractive.
7. Aqueous extract	4.08 per cent. gum, color.

LEAVES.

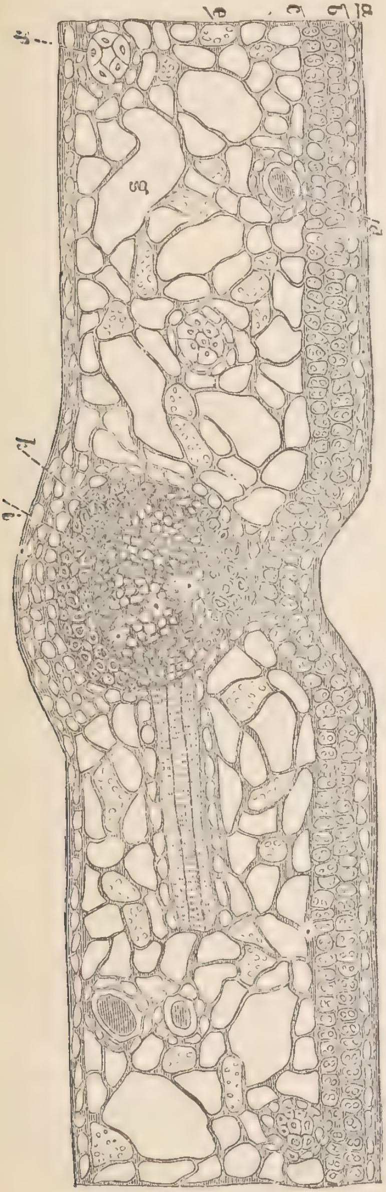
1. Moisture	10 per cent.
2. Ash	8.4 per cent. chlorides, phosphates, sulphates and carbonates of potassium, magnesium, calcium, and aluminium; silica.
3. Volatile principles	Volatile oil, volatile alkaloid.
4. Benzin extract	5.3 per cent. yellow color, volatile oil, chlorophyll, fat, wax.
5. Alcoholic extract	10.2 per cent. resin, tannin, extractive.
6. Hydro-alcoholic extract	6.25 per cent. tannin (4 per cent.), organic acid, color, extractive.
7. Aqueous extract	4.5 per cent. gum, starch, color, extractive.

It appears from the above that the activity of the drug resides wholly in the leaves, and is probably due to a volatile alkaloid, an organic acid, volatile oil, fixed oil, resin, etc. The best solvent for making pharmaceutical preparations is alcohol containing one-third of water.—Amer. Jour. Phar., May 1883, 246–252.

Cheken Leaves—Microscopical Examination.—Mr. John Hoehn has also subjected cheken leaves to chemical examination, the results of which are briefly given, and describes their microscopic character as follows:

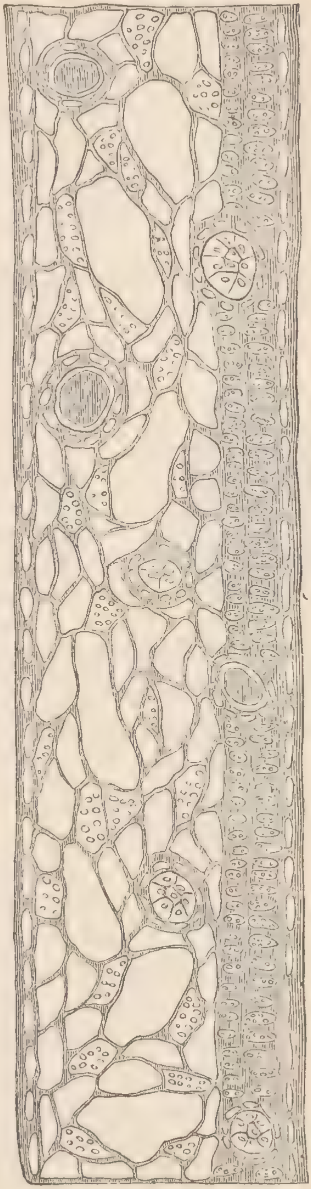
The upper side of the leaf is depressed at the midrib, and the under side elevated. The epidermis is composed of thick-walled empty cells and a thick cuticle. Next come two rows of palisade cells, filled with starch and chlorophyll. Between the palisade cells and lower epidermis are thick-walled parenchyma. Among this there are oil and resin cells

FIG. 34 *a.*



Cheken (transverse).

FIG. 34 *b.*



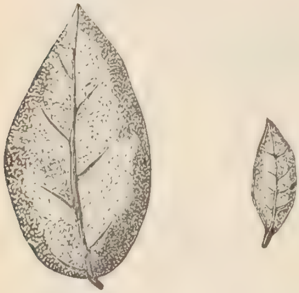
Cheken (longitudinal).

and intercellular spaces. The resin cells seem to have a cellular structure. The midrib is composed of three zones, the upper and lower zones made up of bast-fibre, and the middle one of wood prosenchyma. In the drawing (Fig. 34) the author has represented a branch of the midrib, composed of reticulated vessels. The only difference between the cross and longitudinal is the elongation of cells in the longitudinal section.—Amer. Jour. Phar., May 1883, 253–255, from Therapeutic Gazette, Aug. 1882, pp. 284–286.

Eugenia Cheken, Molina—*Description.*—Dr. J. Moeller gives the following description of cheken leaves:

The leaves are stiff, but not fragile, delicately wrinkled, light green, occasionally yellowish, short petiolate, somewhat revolute on the margin, pellucid-punctate, the venation observable on the lower surface, while on the upper surface only the midrib, and in the larger leaves also only a few secondary nerves are seen; they are almost inodorous, but when rubbed are agreeably aromatic, and have an aromatic, afterwards strongly bitter taste. The cuticle is particularly prominent upon the upper surface; the palisade cells form two rows, occupying scarcely one-third of the thickness of the leaf, and contain occasionally a group of crystals; the mesophyll consists of loose, irregularly-branched parenchyma, and rarely contains crystals; the globular oil glands, with deep yellow contents, are scattered under the cuticle upon the upper and lower surface.

FIG. 35.



Cheken leaves, natural size. *a*, upper surface. *b*, lower surface.

The virtues of cheken leaves reside in the tannin and volatile oil.—Amer. Jour. Phar., Sept. 1882, 461, from Phar. Centralhalle, 1882, No. 29.

Eucalyptus Resinifera—Collection of Gum in New Zealand.—See "New Zealand Drugs."

LEGUMINOSÆ.

Mimosa Pudica—Action of Certain Drugs.—Mr. A. S. Rauschenberg has made some interesting experiments upon the action of certain drugs on the "sensitive plant," which are given in detail in "New Remedies" (April 1883, 101–102), to which reference may be had, since the paper cannot be advantageously condensed.

Gum Arabic—Adulteration.—Herz has met with a gum arabic which, besides yellowish and reddish pieces, some of them weighing 40 gm., contained about 8 per cent. of tragacanth, mostly the nodular Syrian variety, but likewise opaque flakes and vermiform Morea tragacanth, some pieces measuring four centimeters. Such adulteration is said to be of not unfrequent occurrence in Southern Germany.—Amer. Jour. Phar., March 1883, 145, from Phar. Zeitung, 1883, No. 1.

Negro Coffee—Value as a Substitute for Coffee.—Dr. Nichols, of Dominica, reports that the use of the seeds of

Cassia Occidentalis as a coffee substitute is well known amongst the negro inhabitants of that island. He has had "coffee" prepared from the roasted seeds, and found it to produce an excellent coffee substitute. In fact, he was unable to distinguish it from the excellent coffee used in the island, the aroma being fully equal to that of the genuine article. The plant itself is used by the native "doctors" medicinally in the form of a decoction, and it has the reputation of being a good diaphoretic. The weed is very common, and can be obtained in large quantities.—Phar. Jour. Trans., January 13, 1883, from Rep. on the Royal Garden at Kew.

Tragacanth—Collection in New Zealand.—See "New Zealand Drugs."

Astragalus Mollissimus—Physiological Action.—Dr. Isaac Ott has made a series of experiments to determine the physiological action of this plant, one of the

"*Loco*" or "Crazy Weeds" of the West. The infusion was found to lower the rate of the heart-beat, and to temporarily increase the arterial tension, after which it falls. The active principle of the plant is also a powerful mydriatic, like atropine and its congeners. The antidote for this agent must be addressed to counteracting the effect of the drug on the heart and on the nervous system. The action of the plant, which shows it to be an important medicinal agent, is formulated by the author as follows:

1. It decreases the irritability of the motor nerve.
2. Greatly affects the sensory ganglia of the central nervous system, preventing them from readily receiving impressions.
3. Has a spinal tetanic action.
4. Kills mainly by arrest of the heart.
5. Increases the salivary secretion.
6. Has a stupefying action on the brain.
7. Reduces the cardiac force and frequency.
8. Temporarily increases arterial tension, but finally decreases it.
9. It greatly dilates the pupil.

—New Rem., August 1882, 226–227.

Balsam of Peru—Qualitative and Quantitative Examination.—Dr. O. Schickum, after giving the details of numerous experiments made with a view to determine the purity of balsam of Peru, communicates the following qualitative and quantitative methods for its examination:

SCHEME FOR THE QUALITATIVE EXAMINATION OF BALSAM OF PERU.

(1) The specific gravity should be determined. It should never fall below 1.135.

(2) Upon shaking 1 gram of balsam three or four times with several

grams of petroleum spirit, not more than .05 gram should be taken up, so as to be left behind upon evaporation. Otherwise an admixture of castor-oil or copaiba balsam would be probable. The latter would be recognizable by the odor of the essential oil.

(3) Dissolve 1 gram of balsam in several grams of carbon bisulphide and estimate the undissolved portion, dried at 140° C. This should not amount to more than 0.16 gram, otherwise an admixture of benzoin is probable.

(4) *a.* Mix 1 gram of balsam with 1 to 1.2 gram of concentrated sulphuric acid. If frothing and a smell of burning sulphur be observed, an admixture of copaiba balsam is probable. (Confirm by tests 2 and 5.)

b. After the mixture has cooled, wash it first with hot and then with cold water. The residue should be at first plastic and afterwards hard and brittle. A smeary character indicates an admixture with castor-oil. (Confirm by test 2.)

c. Dry the washed resinous mass superficially with blotting paper, and dissolve it in several grams of ether. It should dissolve completely; if an insoluble residue be left it indicates an admixture of benzoin or storax. Treat this insoluble residue with strong alcohol, or preferably with acetone. If it dissolves completely, the adulterant is benzoin, in cases where carbon bisulphide leaves more than 16 per cent. of the balsam undissolved (test 3). If after treatment with alcohol (or acetone) there remains a white powder, easily soluble in chloroform, and separating in microscopic crystals upon evaporation of the solvent, storax is present. (Confirm by test 5.)

(5) Dissolve 1 gram of balsam in 3 grams of ammonia solution, specific gravity .960. No gelatinization of the mixture should take place or appearance of gelatinous fragments swimming in the ethereal layer; otherwise storax is present. (Confirm by test 4.) The mixture should separate readily into two layers, the lower of which when separated, supersaturated with acetic acid and heated to boiling, should only present a slight turbidity. The separation of solid resin shows copaiba balsam or colophony. The former gives the reaction mentioned under test 4; further, the extract obtained by evaporation of the petroleum spirit solution (test 2) has clearly the smell of oil of copaiba, whilst a colophony residue has no special odor.

QUANTITATIVE ESTIMATION OF ADULTERANTS.

(1) *Estimation of Benzoin Admixture.*—*a.* An admixture of solution of benzoin increases the amount insoluble in carbon bisulphide, which in the case of genuine Peru balsam was never found by the author to exceed 16 per cent., to the extent of the whole of the benzoin resin, exclusive of the benzoic acid by which it is accompanied, and this may be used as the basis of one method of estimating the extent of adulteration with benzoin.

Example.—1 gram of a mixture of equal parts of Peru balsam and an alcoholic solution of benzoin containing 75 per cent. of resin, when treated with carbon bisulphide, left a residue which, dried at 100° C., weighed 0.38 gram. Of this 0.08 gram is reckoned as belonging to the half gram of Peru balsam, and the remaining 0.30 gram as the amount of resin in the half gram of benzoin solution.

b. A second method of estimating added benzoin is based upon the amount of residue insoluble in ether after the sample of balsam has been treated with sulphuric acid. The undissolved residue amounts to about half the benzoin resin or one-third of the benzoin solution.

Example.—1 gram of a Peru balsam containing 14 per cent. of benzoin solution, after treatment with sulphuric acid, left a residue of 0.05 gram insoluble in ether, which represented 10 per cent. of benzoin.

c. The direct estimation of the Peru balsam in a sample adulterated with benzoin may be effected by repeatedly shaking it with petroleum spirit, which dissolves out nearly half the Peru balsam as well as the benzoic acid of the benzoin. If 1 gram of the balsam be mixed with 0.30 gram of calcic hydrate, and allowed to stand an hour, the petroleum spirit then dissolves only 41 per cent. of the balsam of Peru present, so that the quantity of this may easily be calculated.

Example.—From a balsam mixed with 14 per cent. of benzoin solution, after maceration with calcic hydrate, petroleum spirit dissolved 35 per cent. (cinnamein), which according to the proportion $41:100=35:x$, indicated 85 per cent. of Peru balsam.

(2) *Estimation of Admixture of Purified Storax.*—As purified storax consists, like Peru balsam, mainly of styracin, cinnamein and cinnamic acid, though with a greater preponderance of styracin, the estimation of added storax is difficult, and can only be effected by preparation of the crystalline styrogenin as above described. The quantity of styrogenin left after evaporation of the chloroform amounts to about 7 per cent. of the storax present in the balsam.

Evample.—1 gram of a mixture of equal parts of Peru balsam and purified storax yielded 0.03 gram of styrogenin.

(3) *Estimation of Admixture of Colophony.*—*a.* The direct estimation of colophony is effected by shaking the ethereal solution of balsam with ammonia solution, sp. gr. .960, as before described, and separating the resin taken up by supersaturating with an acid. The solid resin dried at 100° C. amounts to seven-eighths of the colophony present.

Example.—1 gram of balsam mixed with 23 per cent. of a 60 per cent. solution of colophony yielded 0.115 gram of solid resin from the ammoniacal layer of liquid.

b. The direct estimation of the Peru balsam present may be made by macerating the sample with caustic lime and exhausting with petroleum, as in the estimation of benzoin.

Example.—1 gram of balsam containing 23 per cent. of solution of colophony, macerated with caustic lime, gave up to petroleum spirit 0.32 gram (cinnamein), corresponding, according to the proportion, 41:100, to 0.78 gram of Peru balsam.

(4) *Estimation of Admixture of Castor Oil.*—The author was unable to accomplish the direct estimation of the castor oil, being unable to separate it from the balsam by any suitable solvent; nor was he more successful in saponifying it with an alcoholic solution of an alkali. An attempt was also made to remove the oil from the resinous mass resulting from treatment with sulphuric acid, but it was found that the castor oil was so much decomposed by the strong acid as to be no longer soluble in petroleum spirit.

a. The amount of admixture may, however, be estimated by first ascertaining the amount of cinnamein and castor oil dissolved out by petroleum spirit, and then the amount of cinnamein alone. 1 gram of the mixture of balsam and castor oil is first macerated for an hour with 0.30 gram of caustic lime, without the addition of water, and then exhausted with petroleum spirit, which dissolves the cinnamein (41 per cent.) of the balsam together with all the castor oil. A second quantity, with the addition of water, is macerated in a water-bath for several hours, by which the saponification of the oil, but not of the balsam, is induced. Petroleum spirit then dissolves only the cinnamein of the balsam. The difference in the two results gives the amount of castor oil, whilst the quantity of Peru balsam can be easily calculated from the cinnamein. Of course the exactitude of the result is dependent upon the complete saponification of the oil.

b. A more simple plan is to exhaust the sample by three or four shakings with petroleum spirit, and then to estimate the soluble constituents by evaporating the solution, and the insoluble by drying the residue. The former include nearly one-half of the Peru balsam, together with castor oil; the latter more than one-half of the Peru balsam present. By subtracting the amount undissolved from that dissolved, an approximation to the quantity of castor oil is obtained.

Example.—1 gram of balsam containing 23 per cent. of added castor oil, left after four shakings with petroleum spirit 0.40 gram undissolved, which indicated approximately 80 per cent. of Peru balsam. The petroleum spirit left upon evaporation 0.60 gram of oily residue, which quantity indicated somewhat more than 20 per cent. of castor oil (0.60—0.40 =0.20).

(5) *Estimation of Admixture of Copaiba Balsam.*—*a.* The proportion of Peru balsam is estimated directly by digesting the sample for several hours with caustic lime and water, exhausting the mass completely with petroleum spirit and leaving the filtered liquid to evaporate. In this

way there is at first obtained 41 per cent. of the Peru balsam, together with the essential oil of copaiba. To volatilize the latter, the residue is heated in a water-bath until it no longer perceptibly loses weight. What is now left represents 41 per cent. of Peru balsam, whilst the loss in weight gives the amount of essential oil of copaiba.

b. The amount of copaiba resin is found by means of the caustic ammonia test, as described for colophony. If to this be added the amount of essential oil as obtained in the preceding experiment, the total will represent the amount of copaiba balsam present.

Example.—1 gram of Peru balsam containing 30 per cent. of added copaiba balsam after being digested with lime and water gave up to petroleum spirit 0.38 gram, which in the water-bath decreased to 0.27 gram, representing 0.11 gram of essential oil. The 0.27 gram of residue indicated 66 per cent of Peru balsam (41:100). 1 gram of the same sample gave when treated with ammonia solution 0.17 gram of solid resin, which added to the 0.11 gram of essential oil made a total of 0.28 gram, or 28 per cent. of copaiba balsam.

b. A more simple and sufficiently exact method is to shake the sample repeatedly with petroleum spirit, and to weigh the undissolved portion after drying at 100° C., and the dissolved portion after evaporation of the spirit at the ordinary temperature. The undissolved portion amounts to a good half of the Peru balsam, and by subtracting the amount from that of the evaporation residue, an approximation to the quantity of copaiba balsam is obtained.

Example.—1 gram of Peru balsam containing 30 per cent. of added copaiba balsam, left after shaking with petroleum spirit 0.35 gram undissolved, or equal to 70 per cent. of Peru balsam. The petroleum spirit left upon evaporation 0.65 gram. Consequently 0.65 –0.35=0.30 gram (30 per cent.) of copaiba balsam.—Phar. Jour. Trans., Oct. 21, 1882, from Archiv der Pharmacie, in Amer. Jour. Phar., Dec. 1882, 607—617.

Legund.—A new test for the presence of *organic acids* in Phenol. See *Organic Acids*, under "Organic Chemistry."

Gurjun Oil.—Application as a test for the presence of mineral acids in *Vinegar*, which see under "Organic Chemistry."

Copaiba—Tests.—According to Dr. H. Hager, the thick copaiba balsam, officinal in Germany, has a peculiar relation to 90 per cent. alcohol, which is not only a proof of its good quality, but detects the presence of most possible adulterants. The thick Maracaibo balsam gives a clear solution, with one, and often with two parts of 90 per cent. spirit. If two or three more volumes of the same spirit are added, the mixture becomes, after shaking, very turbid and almost milky. If the balsam to be tested is mixed with a volume and a half of 90-per cent. spirit, a clear solution should result. If it is turbid, there may be present rosin oil, colophony, gurjun balsam, or some fatty oil. If the solution is clear, it is further diluted with its own volume or a volume and a half of the same spirit. It ought to become very turbid. If it remains clear, or becomes only so slightly turbid that a layer a centimeter thick does not hinder vision, the balsam is adulterated with castor oil, turpentine oil, or turpentine. Sassafras oil alone does not interfere with the relation of the balsam to the spirit.—New Rem., May 1883, 136, from Pharm. Centralhalle, through Chem. and Drug.

Kino—Constituents.—A. Kremel has examined Malabar kino, Butea gum, Eucalyptus kino, and kino from Coccoloba uvifera, and found them all free from kinoin discovered by Etti (see Amer. Jour. Phar., 1872, p. 600); instead of a body acquiring, like kinoin, a red color with ferric chloride, protocatechuic acid was obtained, alone or mixed with gallic acid.

The presence of pyrocatechin in kino has been observed by Eichstedt, Flückiger, and others. Preusse ascertained that pyrocatechin is extracted by ether from an alkaline solution, while for the extraction of protocatechuic acid, the solution requires to be acidulated. Following this process, Kremel proved the absence of pyrocatechin from the above named varieties of kino; the ether residue was amorphous, insoluble in hot water, and the alcoholic solution without action on ferric chloride. But from the acidulated solution of Malabar and eucalyptus kino, ether took up a crystallizable body, of acid reaction which in aqueous solution, like pyrocatechin, was colored green by ferric chloride; sodium bicarbonate added to this caused a violet color; the crystals were, therefore, protocatechuic acid.

Butea gum and coccoloba kino treated in the same manner yielded crystals of neutral reaction, becoming green by ferric chloride, but on the further addition of sodium bicarbonate, ferric hydrate was precipitated. The nature of these crystals could not be determined for want of material.

The different kinds of eucalyptus kino examined, yielded from ether, besides protocatechuic acid, also a body the aqueous solution of which acquired after the addition of sodium carbonate, gradually an emerald green color, which on the addition of hydrochloric acid turned red and finally became decolorized; these reactions prove the presence of gallic acid.

On preparing kinic red by Etti's process from eucalyptus kino, extracting the product with ether, fusing it with caustic potassa, dissolving in water, acidulating and extracting with ether, Kremel obtained considerable amount of protocatechuic and gallic acid.—Amer. Jour. Phar., May 1883, 267, from Phar. Post, 1883, No. 11.

Lupine—Isolation of Poisonous Principle.—According to Carl Arnold, the principle contained in many lupines, which produces the so-called lupinose disease, may be isolated, together with some albumin, by the following method: The finely ground toxic lupines are mixed to the form of a thin paste with water containing 2 per cent. of anhydrous sodium carbonate, at a temperature of 40 to 50° C., and the mixture allowed to macerate for 2 days at the ordinary temperature. The liquid obtained therefrom by expression is concentrated as far as possible at a temperature not exceeding 60° C., after having been previously neutralized with acetic acid. To the cooled liquid concentrated acid is then carefully added until no further precipitate is produced; the acid liquid is filtered from the ensuing precipitate of legumin, concentrated on the water-bath, at a temperature not exceeding 60° C., to the consistence of a thick syrup, and then poured into 15 times its volume of 90 per cent. alcohol. After standing for 24 hours the obtained precipitate is collected and pressed, and dried between filtering paper. The mass so obtained possesses a shining, brown, resinous appearance, an agreeable aromatic odor and taste, dissolves slowly in water, with the formation of a turbid liquid, and produces in animals, even when administered in small doses (about 10 grams), acute jaundice, as also the other symptoms of lupinosis.—Amer. Jour. Phar., April 1883, 192–193, from Ber. der Deutsch Chem. Ges., No. 4, 1883, p. 461.

Jequirity—A New Remedy in Ophthalmic Complaints.—The seeds which have been recently introduced under the name of "jequirity," as a remedy in ophthalmic complaints, are derived from *abrus precatorius*, a plant indigenous to Africa and Southern Asia, and naturalized in tropical America. The hard seeds have a bright red integument, with a black spot surrounding the raphe. They are used in Oriental countries for ornaments, and similar to beads; in Brazil they have been highly valued for several centuries in the treatment of certain diseases of the eyes, an infusion being made of 32 powdered seeds (about 3 gm.), which are macerated for 24 hours with 500 gm. cold water, after which 500 gm. of hot water is added, and, when cool, the liquid is filtered.

The results obtained by L. de Wecker, show that this infusion produces conjunctivitis purulenta or cruposa as rapidly as inoculation, and that with due care, the desired inflammation may be well regulated. The experiments have not been concluded yet, and the active principle of the seeds is still unknown; an alkaloid prepared by Rigand & Dusart did not give similar good results, whether used by instillation or subcutaneously.—Amer. Jour. Phar., May, 1883, 265, from Phar. Centralhalle, 1883, p. 145. Klin. Mon. f. Augenheilkunde.

Abrus Precatorius—Therapeutic Uses, etc.—A review of the character of the seeds of this plant, and the therapeutic uses to which they have been applied, particularly in recent years, will be found in "New Remedies" (June 1883, 164–164). The article is accompanied with a handsome chromo illustration, showing the botanical characters of the plant.

Tamarinds—Constituents.—Carl Mueller examined 9 samples of East Indian tamarinds with the following results:

	Seeds.	Pulp free from seeds.					Dry pulp.	
		Water.	Insoluble.	Potass. Bitart.	Tartaric Acid.	Citric. acid.	Potass. Bitart.	Tartar. acid.
Highest per ct.,	38.0	30.81	20.2	6.01	8.80	3.95	8.25	12.25
Lowest per ct.,	1.5	21.92	12.2	4.66	5.29	0.64	6.21	6.77
Average per ct.,	13.9	27.00	16.2	5.27	6.63	2.20	7.20	9.09

The author found very small quantities of malic acid, which were calculated as citric acid. In his opinion, tamarinds should not contain more seeds than 10 per cent. of their weight; four of the samples contained considerably less (1.5, 2.4, 4.5, 6.0), two approached this limit (8.7, 9.8), and three exceeded it considerably (20.6, 23.3, 38.0). Amer. Jour. Phar., April 1883, 194, from Phar. Centralh., 1882, Nos. 49, 50.

Pongomia Glabra—Medicinal Uses of the Expressed Oil.—This tree is, according to Wm. Elborne, extensively diffused throughout Southern India, Malacca, and the Indian Archipelago, and also found in Southern China and North Australia. It has smooth, imparipinnate leaves, composed of 5 or 7 egg-shaped or broadly elliptical leaflets, and loose axillary racemes of flowers. In India an oil called *pongamia* or *kurung oil* is expressed from the seeds and is described in most works on Hindu materia medica as being a favorite remedy amongst the natives for various skin diseases. The oil is of a deep, yellow color, inclined to reddish-brown, and is fluid at temperatures above 60° F., but below that it becomes solid. Surgeon-Major Dymock, of Bombay, has recently called attention to the use of pongamia oil in pityriasis versicolor. Several cases occurring on the neck, face, and shoulders were cured in less than a fortnight by rubbing in the oil twice a day. He concludes that it is likely to be of service in other skin diseases, which, like pityriasis, are attended by the growth of a fungus. Dr. Dymock considers this oil much more effective than acetic acid, while it has the advantage over iodine and Goa powder of not discoloring the part (often the face) to which it is applied. Dr. Thin has recently stated that sulphur ointment is an admirable remedy for ringworm, but pongamia oil might be used in cases where the disease is of a recurrent character.—Amer. Jour. Phar., May 1883, 266, from Phar. Jour. Trans., Feb. 24, 1883, 688.

TEREBINTHACEÆ.

Pistacia Terebinthus—Character of the Resin.—Pistacia resin, which has recently appeared in commerce, is according to Christy well adapted for varnishes. It is light-yellow, soluble in fixed oils, oil of turpentine, and alcohol, has a mastich-like odor, and, mixed with common resin, is not affected by a 25 per cent. solution of soda. The varnish dries rapidly in the air, and is well adapted for painting upon glass and porcelain. —Amer. Jour. Phar., Dec. 1882, 627, through Phar. Zeits. Russl., Oct. 3, 1882, p. 75, from Jour. Phar. Chem.

Semecarpus Gardneri, Thw.—*Uses of the Black Resin Yielded by the Tree.*—Dr. W. C. Ondaatje draws attention to the black resin yielded by this tree, as being of some possible interest in the arts. It is hard, breaks with a smooth fracture, burns with a bright flame, is soluble in oil of turpentine, and adheres strongly to wood and metal. A varnish is prepared by adding gradually pieces of the black resin—previously purified by melting and straining—to a saturated solution of *Vateria Indica* resin in oil of turpentine, and dissolving by frequent agitation in a bottle. The varnish possesses great lustre and beauty.—Phar. Jour. Trans., April 7, 1883, 819.

PIPERACEÆ.

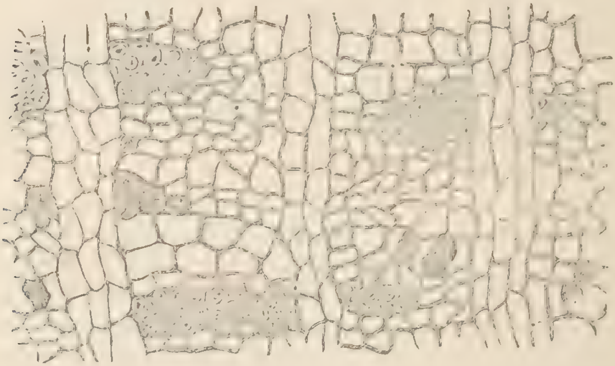
Pepper—Adulteration of the Powder with Olive Pits.—Prof. Charbonnier directs attention to an adulterant, which is not a new one, but at present appears to be very extensively employed in France, particularly for white pepper. This is the putamen of olives, known in commerce as *grignons d'olive* (olive pits), or as *poivrette* (little pepper), a name probably given to it to create the belief as if it contained some of the properties of pepper. These olive pits were formerly burned up and used as manure (engrais); now it is found more advantageous to sell them at 25 or 30 francs for 100 kilos, and to use them for the adulteration of pepper. According to the treatment to which they are subjected, a gray or white powder is obtained, adapted for the adulteration of powdered black or white pepper. The hard shell consists of elongated stone cells resembling those found in the epicarp of black pepper; but since white pepper is deprived of the pericarp, the adulteration of its powder with ground olive pits is readily detected under the microscope by the large number of stone cells.—Rép. de Phar., 1883, pp. 19–21.

The adulteration of pepper with olive pits is readily detected, according to Dupré, by dusting the powder upon a liquid composed of equal parts of glycerin and water, upon which the powdered pepper will float, while the powdered olive pits will sink.—Amer. Jour. Phar., June 1883, 326, from Monit. Prod. Chim. xiii. 34.

RHAMNACEÆ.

Rhamnus Purshiana—Microscopical Examination of the Bark.—The bark of Rhamnus purshiana has been examined microscopically by Dr. J. Moeller. The corky layer is about .045 mm. thick, and consists of 8 or 12 rows, somewhat flattened, rather thick-walled, but not sclerotic cells. The parenchyma of the primary bark is tangentially elongated, partly of a collenchymatic character, free from secondary cork, and contains scattered groups of roundish stone cells, with very thick walls, and accompanied by single rhombohedric crystals; the thin-walled parenchyma contains numerous groups of crystals. The inner bark consists of medullary rays composed of two or three rows of thin-walled, somewhat radially elongated cells, and of broader bast rays in which the parenchyma cells are coarsely dotted upon the radial and horizontal walls, and loosely united in a tangential direction; the sieve-tubes are larger, irregularly angular, and united, to the number of 4 or 6, by means of coarsely porous sieve-plates, and on the radial sides marked with roundish sieve fields; the bast fibres form alternate groups of two or three rows, extending into few bast rays, and are surrounded by crystal cells. The medullary parenchyma contains a crummy, lemon-yellow substance, which dissolves in water with a yellow, and in cold potassa solution with a dingy red color.

Fig. 30.



Rhamnus purshiana; transverse section through bast layer.

Cascara sagrada is thicker and more fragile than frangula bark, and differs from the latter also in containing groups of stone cells in the primary bark, and a few such groups also in the bast layer.—Amer. Jour. Phar., Sept. 1882, 462, from Phar. Centralhalle, 1882, No. 28.

EUPHORBIACEÆ.

Cassava Root—Presence of Hydrocyanic Acid in the Sweet as well as in the Bitter Variety.—Mr. E. Francis undertook an inquiry to determine the amount of hydrocyanic acid in cassava root, the results of which are published recently in the Journal of the Royal Agricultural and Botanical Society of British Guiana. An examination was made, not only of bitter cassava, but also of a number of samples of sweet cassava, and, contrary to expectation, the latter were found to contain nearly as much prussic acid as the former. Fifteen samples of sweet cassava were obtained from different cultivators in Trinidad, and every one of them contained prussic acid, nine out of the number (or 60 per cent.), yielding sufficient, from one pound of the root or half pint of the juice, to kill an adult. The following summary shows the average, as well as the highest and lowest quantities of prussic acid, that were met with in 15 samples of sweet, and 10 samples of bitter cassava:

Sweet Cassava (15 Samples).

	Per cent. of prussic acid.	Grains of prussic acid per lb.
Average	.0168	1.175
Highest	.0238	1.666
Lowest	.0113	0.791

Bitter Cassava (10 Samples).

	Per cent. of prussic acid.	Grains of prussic acid per lb.
Average	.0275	1.927
Highest	.0422	3.094
Lowest	.0132	0.924

The juice of the bitter cassava, mixed with molasses and fermented, has been made into an intoxicating liquor, which is much relished by the negroes and Indians. The concentrated juice, known in the colony ot British Guiana as cassareep, is an Indian preparation. One of its most remarkable properties is its highly antiseptic power, preserving meat that has been boiled in it for a much longer period than can be done by any other culinary process.—Amer. Jour. Phar., Jan. 1883, 34–36, from Chem. and Drug., Nov. 15, 1882.

Tapioca—Cultivation in Malacca.—An interesting account concerning the cultivation of tapioca in Malacca, taken from "Gardener's Chronicle," is given in Phar. Jour. and Trans., (July 15, 1882, 48, 49), from which the following is extracted: After the ground has been dug and the soil put into a friable condition, the cuttings of tapioca are planted in rows from 3 to 4 feet apart, and about nine inches or a foot in the rows. The cuttings are lengths about a foot long of the stem of the matured plant. These root easily, and in less than two months are about a foot high. From this time to the time the crop is lifted, beyond weedings and slightly banking-up, nothing is done to the crop. On some estates the crop is lifted nine months after planting, with good results; but the Chinese planters in Malacca usually keep the roots in the ground sixteen or even eighteen months. The author has seen some specimens of tubes over 2 feet long, and weighing between 6 and 7 pounds. For the preparation of tapioca, even in the most primitive styles, steam is the motive power. After describing the mode of extracting the starch by patent machinery, which differs very little from well-known methods, a description of the primitive style, as carried out on one of the Chinese estates, is given. The roots are first half peeled with knives, in which operation a large part of the root is cut off, then thrown in a tank of water, where they are washed by the Chinese treading on them; thence they are lifted in baskets to the rasping machine, which is worked by a traction engine, built in the brick work, and regulated by hand. The pulp falls from the rasper into baskets, which are carried about twenty yards, and the contents emptied on muslin covers of concave wickerwork baskets, above which a wooden gutter is placed, the supply of water being regulated by plugs over the baskets. Here the Chinamen separate the starch by arranging a constant fall of water on the muslin, and keeping the mass well stirred with their hands until they think they have extracted all the starch, when they throw the refuse pulp away, and receive a fresh supply from the rasper, the water with which they wash the pulp serving to convey the starch to vats prepared for it. The starch prepared in this manner requires more washing than that prepared by machinery. It is baked by fire passing beneath a tile-covered flue, on which it is placed. *Pearl tapioca* is manufactured here as follows: A cloth is attached like a hammock to the beams, and kept open by cross-sticks. A man at each end alternately jerks the cloth to and fro, the slightly warmed starch under this treatment soon forming small, completely spherical balls, which are afterwards baked on a tile-covered flue.

Buxus Sempervirens.—Characters, etc., of Active Principles.—Box tree bark has already been the object of chemical research by Fauré, by Pavia, and by Barlaglia. Pavia claimed the discovery of two alkaloids, which he named *buxine* and *parabuxine*. Mr. P. E. Alessandri, however, finds the supposed alkaloids to be really a mixture of resinous matters of a deep yellow color By changing the method of extraction, employing his oxalic acid method previously described by him, (see "Cascarilline," Proceedings 1882, 436,) Mr. Alessandri has succeeded in isolating from the dried and fresh leaves, and from the bruised bark, three distinct principles in a pure condition, which he names respectively *buxine*, *buxeine*, and *parabuxine*, the chemical and physical characters of which are as follows:

	Buxine.	Buxeine.	Parabuxine.
Color.	White.	Yellowish white.	Purplish yellow.
Structure.	Crystalline.	Crystalline.	Amorphous.
Solubility.	Slightly soluble in water, more so in in alcohol; freely in ether.	Slightly soluble in water; soluble in alcohol and ether.	Freely soluble in water and alcohol; insoluble in ether.
With HNO_3.	Turns reddish purple.	Turns greenish-yellow and then brick red.	Turns greenish yellow, with no approach to red.
With H_2SO_4.	Turns brick red.	Turns blood red.	Turns greenish yellow and then darkens.
With H_2SO_4 and $K_2Cr_2O_7$.	Turns canary yellow in the cold. Gives a green cloud when hot, that at once disappears.	An orange precipitate; when heated dissolves and gives a green solution.	Gives no precipitate, but with heat gives a grass-green solution.

The *buxine* is present in the bark; the *buxeine* in the leaves; and *parabuxine* in both, but most abundant in the bark. The first two may prove identical on further researches, but parabuxine is sufficiently distinct, and appears sometimes to have an acid reaction. The method finally adopted by the author for the extraction of *buxine* and *parabuxine* is briefly as follows: (1) Make a cold infusion of coarsely powdered box-bark with a 2 per cent. solution of oxalic acid. (2) Filter and press after 24 hours, and exhaust the remaining bark with a fresh portion of oxalic solution, filtering, and press again. (3) Concentrate the infusion at a gentle heat, add ammonia in excess, and allow the resulting precipitate to subside. (4) Collect the precipitate on a filter and treat with dilute acetic acid. Precipitate again with ammonia, and wash with weak ammonia. (5) Treat the precipitate with hot alcohol and evaporate to one-third. (6) Shake up the residue with ether repeatedly. (7) Evaporate the ether and set aside the undissolved portion. (8) Dissolve again in acetic acid and precipitate. This process gives nearly white and pure *buxine*, which may be obtained completely white by treatment with animal charcoal, whereby, however, a large quantity of the alkaloid is absorbed and lost. (9) The portion undissolved by ether is treated with acetic acid and mixed with the residual liquor of the first treatment. (10) Evaporate the acetic solution slowly down to one-half, and treat with ammonia. Collect the yellowish magma on a filter. Evaporate the residual liquor down to one-half, precipitate, unite the two precipitates, and wash with weak ammonia water. (11) Wash the magma with ether, and dissolve the residue in pure alcohol. This alcoholic solution on evaporation yields nearly pure *parabuxine*.—Phar. Jour. Trans., July 8, 1882, 23–24, from Annali di Chimica.

Castor-Oil Plant—A Possible Fly Poison.—According to M. Rafford's observations, the castor oil plant placed in a room has the effect of driving the flies from the room completely. He also found under a castor oil plant—on the under side of the leaves—a large number of dead flies. He believes that some toxic principle or essential oil exists in the leaves which is very destructive to insect life.—New Rem., Oct. 1882, 303, from the Monthly Magazine of Pharmacy.

Stillingia Sylvatica—Examination of the Root.—John H. Hamarson has made an examination of stillingia root, with results which indicate the presence of a volatile alkaloid. The alcoholic tincture, rendered alkaline with potassa and distilled, yields an alkaline liquid which, on being neutralized with sulphuric acid and evaporated, furnished yellow crystals, and these, by treatment with charcoal and recrystallization, become white and odorless, and yield precipitates with phosphomelybdic acid, tannin, and Mayer's reagent, but not with chloride of gold.—Amer. Jour. Phar., Aug. 1882, 386.

Omphalea Oleifera, Hemsley—*Description of the Plant.*—Some twenty years ago, Dr. Dorat, of Sonsonate, sent to the late Daniel Hanbury, dried specimens of the *tambor tree*, accompanied by rather meagre descriptions of the fruit, leaves, and seeds. W. B. Hemsley now describes this plant as a new species under the above name, as follows: Leaves large (specimen five inches in diameter), petiolate, papyraceous, somewhat stellately puberulate, with deciduous hairs, suborbicular, deeply cordate; flowers monœcious; the panicle terminal, broad, paniculate, puberulate; bracts small, petiolate, narrow, about an inch long, veined, puberulate; sepals 4, decussate, orbicular, ciliolate; anthers 2; ovary glabrous; fruit three-seeded; seeds black.

The same author describes also a plant collected by Sutton Hayes, at Acajutla, near Sonsonate, as follows:

Omphalea Cardiophylla, Hemsley.—Leaves long-petiolate, papyraceous, very smooth, suborbicular, deeply cordate at the base, acuminate, obtuse (about a foot in diameter), undulate; petiole with two glands above, fleshy; staminate flowers in narrow terminal panicles, a foot or more in length; bracts oblanceolate, about two inches long, short-petiolate; sepals four, orbicular, ciliolate; anthers two, sometimes three.—Amer. Jour. Phar., Feb. 1883, 96–97, from Phar. Jour. and Trans., 1882, Oct. 14, p. 301.

URTICACEÆ.

Stinging Nettle—Supposed Alkalinity of the Poison.—The poison of the stinging nettle is usually stated to be formic acid. But Alfred W. Bennett is inclined to believe that the irritant fluid always has an alkaline reaction.—Amer. Jour. Phar., Feb. 1883, 98, from Phar. Jour. and Trans., 1882, Oct. 14, p. 320.

Cannabis Indica—Alkaloidal Constituents.—Experiments made by Dr. Matthew Hay led him to the belief that cannabis indica contains several alkaloids, and he is now engaged in investigations with a view to giving a nearer description of their distinctive action, toxic action, etc. One of these alkaloids he has obtained in a considerable degree of purity. It is rather remarkable in that its action is similar to that of strychnia, and it is evidently, therefore, quite a secondary alkaloid of the cannabis. It was obtained from a watery infusion of powdered cannabis indica, by a process which need not be reproduced here The alkaloid is easily soluble in water, soluble in alcohol, more slowly soluble in ether and chloroform. Its solution in water is precipitated by the different alkaloidal precipitants. It caused tetanus in frogs in exactly the same manner as strychnia, increasing the excitability of the reflex centres of the spinal cord, but is not chemically identical with strychnia, since it does not give a violet color with sulphuric acid and bichromate of potash.—Phar. Jour. Trans., June 2, 1883, 998–999.

MONIMINACEÆ.

Athrosperma Moschata.—Medicinal Uses of the Essential Oil.—Mr. Bosisto, of Melbourne, has introduced the volatile oil of *Athrosperma Moschata*, which seems to possess some valuable medicinal properties. The physiological effects of this oil, in small doses, are diaphoretic, diuretic, and sedative, and it appears to exert a specific lowering influence upon the heart's action. It has been used in some of the European hospitals, and been successfully employed in heart disease, administered in one or two drop doses, at intervals of six to eight hours. New Rem., Mar., 1883, 80.

SALICINEÆ.

Willow Leaves—Value in Ague.—The "Lancet" says that an Indian surgeon, Chetan Shah by name, has recently revived the use of willow leaves in intermittent fever. This is an old remedy, now almost forgotten in Europe, while the leaves of several species of willow are still largely prescribed by hakims of India and Afghanistan, especially in the form of a distillate. Among the lower classes of Cabul, and especially in women, quinine was found to irritate the bowels, while the juice of the fresh willow leaves, largely diluted with water, rarely failed to cure intermittent fever. In pregnant women the willow leaf is almost always found preferable to quinine.—Amer. Jour. Phar., April 1883, 199, from Medical and Surgical Reporter.

Willow Galls—Examination.—Willow galls, from *Salix nigricans*, Fries, have been examined by Edwin Johanson. They were externally felt-like and spongy, bore at their upper end a cluster of stunted leaves, and had formed on the tender branches, which had thereby become stunted, and within the galls enlarged and sponge-like. The etherial extract of the concentrated aqueous infusion was fat-like, non-crystalline, and contained only traces of tannin-like compound. The lead precipitate from the aqueous infusion contained tannin, giving a green-black precipitate with ferric chloride. The filtrate from the lead precipitate contained no sugar; but the corresponding liquids obtained from the branches and leaves gave reactions for sugar. The alcoholic tincture prepared from material previously exhausted by water indicated by its reactions the presence of bodies related to quercitrin and catechin. Compared with the branches and leaves, the galls had a very similar composition, and contained only a somewhat larger quantity of tannin.—Amer. Jour. Pharm., Sept. 1882, 457, from Phar. Zeitsch. Russ., 1882, p. 455–463.

CONIFERÆ.

Pine Cones—Use of the Resin.—The cones of *Pinus Abies*, called *elata* in Greece, secrete during hot weather an oleo-resin called *elatopyssa*, which congeals in mastich-like taars, and, according to Landerer, is popularly employed in the form of pills and decoction in coughs, bronchitis, and in diseases of the bladder. The cones with the tears are not unfrequently kept in rooms on account of their balsamic fragrance.—Amer. Jour. Phar., Sept. 1882, 457, from Zeitschr. Œst. Ap. Ver., 1882, p. 170.

A. ANIMAL DRUGS.

PORIFERA.

Sponges—Method of Cleaning.—For removing the greasiness of toilet sponges that have been in use for some time, M. v. Valta recommends the following: The sponge is first washed with water as well as possible, then placed upon a plate, a little powdered calcium chloride being sprinkled over it and allowed to liquefy; after about 30 minutes it may be washed with water and dried, when it will have an appearance like a new sponge.—Amer. Jour. Phar., June 1883, Phar. Zeitung, 1883, No. 27.

INSECTA.

Insects Injurious to Drugs.—Mr. William Edwin Saunders records his observations of insects found in different drugs, giving a brief description of the same.

Sirodrepa panica was found in aconite root, capsicum, bitter and sweet almonds, angelica, boneset, calumba, chamomile, chocolate, coriander, dandelion, elm bark, ergot, extract of licorice, orris root, prince's pine, rhubarb, squill, and sweet flag.

Calandra remotopunctata was found in large numbers in pearl barley.

Tenebrioides Mauritanica was found in pearl barley, and in a specimen of calumba.

Trebolium ferrugineum was found in patent foods and similar substances.

Silvanus Surinamensis was found in anthemis.

Anthrenus Varius was found in cantharides only, but the author believes that it also attacks other animal drugs, such as castoreum. Camphor does not kill the larvæ of this insect, though they seem to have a distaste for it, and the pharmacopœia direction to keep camphor with the cantharides, is therefore not a remedy—merely a preventive measure, and not a very good one either. The vapor of chloroform rapidly kills them.—Amer. Jour. Phar., April 1883, 161–163.

Doryphora Decemlineata—Presence of a Vesicating Principle.—Mr. John D. Forbes has made experiments with live and with dried potato bugs, with the object of determining the presence of cantharidin. His results show that the beetle contains a vesicating principle, but it is uncertain whether this is identical with cantharidin.—Am. Jour. Phar., Nov. 1882, 550.

Honey—Superiority of the American over the German Article.—Eugene Dietrich has repeatedly observed that good American honey may be more easily obtained than German honey of good quality, the latter, on keeping, becoming acid by fermentation, at the same time acquiring an unpleasant taste, and when clarified, of a dark color and a caramel-like taste; but fresh German honey yields, on clarification, an excellent product. The cause for the better keeping qualities of American honey has not been ascertained.—Amer. Jour. Phar., Feb. 1883, 98, from Rundschau, 1882, p. 662.

Honey—Preservation.—According to A. Vogel, honey contains on an average one per cent. of formic acid. Observing that crude honey keeps better than that which has been clarified, E. Mylius has tried the addition of formic acid, and found that it prevents fermentation without impairing the flavor of the honey.—New Rem., Nov. 1882, 330.

PISCES.

Cod-Liver Oil—Preparation.—The following description of the process for preparing cod-liver oil, as practiced at Swampscott, near Boston, is interesting: The livers, immediately on arrival after the day's fishing, are sorted over, and the gall-bladders carefully removed. The great, luscious, flabby masses are thrown into a large oak tub; with this are connected steam pipes. When the receptacle is full and closed, low pressure steam is turned on, and continued for about two hours and a half; then the plugs are taken out at the bottom, and the hot oil streams into buckets. It is now placed into butts in the "cooling room," and allowed to stay there until it is frozen solid, in which condition it is kept until opportunity offers for further treatment, when it is placed into canvas bags holding about four gallons each. These bags are then placed regularly upon a heavy oak table, provided with outer grooves for conducting the liquid, until twelve gallons (bags? Rep.) are in a row.. On this is laid a slab, then again bags, and so layer after layer until about eighty gallons (bags?) are piled up. A ton of pig-iron is then placed upon the top slab of oak, and the oil begins to flow out. In about twelve hours dripping ceases, and the apparatus is taken apart. The yellowish, hard, butter-like mass, which is nearly pure stearine, remaining in the bags, is sold to soap-makers; the limpid oil to those who appreciate its superiority over the foreign oils. —Drug. Circ., Jan. 1883, 14, from "Med. Times."

Japanese Fish Oil—Introduction into Europe.—This oil is extracted during the process of treating fish-scrap for fertilizing purposes, and was refined and used in Japan before the introduction of petroleum, for illuminating purposes. Recently a market for this oil has been found in Europe, chiefly in England, where it is used for about the same purposes as menhaden oil, which it resembles in appearance and properties. It is put up in five-gallon cans, two cans to the case, and sells in England at a price equivalent to 30 cents a gallon.—Amer. Jour. Phar., April 1883, 178, from Oil, Paint and Drug Reporter, 1882, Dec. 20th.

MAMMALIA.

Castor—Presence of a Ptomaine.—Mr. A. Klunge has determined the presence of an alkaloidal substance in castor, which he believes to be a ptomaine, since it possesses the property common to all ptomaines, of reducing ferric salts. It is readily extracted from the castor by distillation with water, and the distillate gives reactions with all the reagents for alkaloids in general use, the most sensitive being bismutho-potassic iodide and phosphomolybdic acid. The author's observations enable the rapid assay of

Tincture of Castor.—Mix the tincture with five or ten times its volume of water, and shake the turbid liquid with a pinch of common salt, whereby the suspended resin is separated. The whole being now poured on a filter, the liquid rapidly passes, perfectly limpid, and in a condition convenient for testing. On submitting the filtrate to the action of the different alkaloidal reagents, but more especially bismuths—bismuthic iodide, phosphomolybdic acid, and ferric chloride with potassic ferricyanide—a very good idea can be formed of the richness of the castor in alkaloid. The last-named test is characteristic for ptomaines, and results in the formation of an intense blue color (Turnbull's blue) when the ptomaine solution is added to the brown solution of ferricchloride and ferridcyanide of potassium. Drug Circ., July, 1882, 100, from Schweiz. Wochenschr. f. Pharm.

Civet—Collection and Uses in Greece.—According to Prof. X. Lauder, the civet cat, *Viverra Civetta*, is known in Abyssinia as *zebad*. It is caught by snares and kept in a cage for the purpose of obtaining the civet, which is removed by means of a small spoon from the pouch between the anus and genitals, and is also found adhering to the trunks of trees from the animal rubbing on them. This secretion is a thick liquid, and is put into the horns of goats, or, for the retail trade, into small tin boxes. It is extensively used as a perfume, sometimes under the name of *moskos*, the men employing it on the turban and the women on their veils. Civet is also used as a remedy in hysterical and other nervous complaints, and is used for protecting cloths from moths, the cloths being kept in chests made of cedar or cypress wood. The price of a civet cat is from 2,000 to 3,000 piastres, and from 500 to 1,500 piastres are paid for the skins, which are used for furs.—Amer. Jour. Phar., Jan. 1883, 4.

Musk—Masking of Odor.—Prof. Wiesenthal uses hydrochloride or sulphate of quinine, whereby the musk becomes inodorous. For removing the penetrating musk odor from the hands, it is sufficient to put a little quinine in the palm of the hand, moisten it with acidulated water, and rub the hands.—Amer. Jour. Phar., May, 1883, 374, from Phar. Post, 1883, p. 73.

INORGANIC CHEMISTRY.

OXYGEN.

Oxygen—Rapid Preparation.—Voracek recommends adding hydrogen peroxide to potassium permanganate, when the evolution takes place at the common temperature and without requiring special caution. According to "Industrie-Blätter," No. 15, a much cheaper source is barium peroxide, to 15 grams of which are added 100 cc. of a mixture of equal volumes of concentrated potassium bichromate solution and nitric acid, sp. gr. 1.2. Instead of the bichromate, potassium permanganate may be employed, but is more costly.—Amer. Jour. Phar., Aug. 1882, 407, from Arch. d. Phar., May 1882, p. 369.

Oxygen—Presence of Chlorine when Prepared from Chlorate of Potassium.—Schönbein observed that chlorate of potassium, heated with a little ferric oxide, yielded oxygen gas contaminated with chlorine. Pettenkofer & Voit have also noticed the presence of chlorine in oxygen gas prepared from a mixture of chlorate of potassium and binoxide of manganese (or powdered quartz, or oxide of copper). A. Wagner, having also made this observation, determined to ascertain the cause, and we quote here the results he arrived at:

Oxygen gas prepared from commercial chlorate of potassium (at least from that used by Wagner) is always contaminated with chlorine. On the other hand, chemically pure chlorate of potassium yields a gas completely free from chlorine, provided every trace of organic substances or carbonic acid gas is absent. Carbonic acid may decompose even chemically pure chlorate of potassium, when heated, so as to liberate some chlorine; the same effect is caused by organic substances, and, in this case, the residue has a strongly alkaline reaction. The presence of chlorate of calcium may also produce the separation of a little free chlorine, as has been already noticed by Wächter.—New Rem., Feb. 1883, 53, from Zeitsch. f. Anal. Chem., 1882, 507.

Active Oxygen—Characters.—Mr. E. Baumann believes that, in addition to ozone and the ordinary inactive form of oxygen, there exists yet another modification—active or nascent oxygen—which, like nascent hydrogen, does not admit of isolation, and can only be examined through its action on other bodies. The active oxygen (O) is the most powerful oxidizing agent known, and is in a state to combine with inactive oxygen (O_2), in order to form ozone (O_3). In its action it differs from ozone, in that it is capable of converting water into peroxide of hydrogen, and the nitrogen of the air into nitrous and nitric acid, which ozone does not. If a mixture of ozonized air and carbonic oxide be passed through baryta water, no turbidity is produced; carbonic oxide cannot be converted into carbonic anhydride by this means, as already pointed out by Remsen and Southworth. If, however, palladium foil saturated with hydrogen, be enclosed in a glass tube with clean lime water, oxygen, and carbonic oxide, turbidity is slowly produced. The active oxygen, developed under these circumstances, possesses a power which ozone does not.—Jour. Chem. Soc., July 1882, 691, from Zeitschr. Physiol. Chem. 5, 244–257.

Ozone and Teroxide of Hydrogen—Formation.—Professor S. Kappel, during his researches on the formation of nitric and nitrous acids from ammonia in contact with copper and air (see nitrogen), has made some interesting observations relative to the formation of ozone and peroxide of hydrogen. He had experimented to determine whether nitrites could be formed from the nitrogen of the air in presence of caustic alkalies and copper, and sums up his observations as follows:

1. When pure air is passed through a pure alkaline solution, in contact with copper, there is scarcely any formation of nitrites, but ozone and peroxide of hydrogen are formed.

2. The alkali is primarily concerned in the formation of the peroxide of hydrogen, with which it combines, and which is liberated on the addition of an acid.

3. Inasmuch as these reactions only occur in the heat, the view that peroxide of hydrogen is an endothermic compound is confirmed.

4. Metals which liberate hydrogen in contact with alkalies, such as zinc, etc., are incapable of producing ozone, because the nascent hydrogen causes reduction.—Arch. d. Phar., Aug. 1882, 573–577.

Ozone—Action on Metallic Salts and Oxides.—Mailfert has studied the action of ozone on metallic salts and oxides, with the following results:

Mercurous Salts.—The *nitrate* is entirely decomposed by ozone, with formation of mercuric nitrate and a yellow precipitate of trimercuric nitrate. The *sulphate* behaves in a similar manner, mercuric sulphate and basic sulphate being formed. Mercurous *chloride* is acted on somewhat more slowly, with formation of mercuric chloride, and a brick-red precipitate, apparently an oxychloride. The *bromide* is acted on in a similar manner. With the *iodide* the action is extremely slow, mere traces of red precipitate being produced even after the ozonized gas had been passed for 15 hours.

Silver Salts.—With the *nitrate*, a bluish-black flocculent precipitate of peroxide is produced, which, however, is decomposed and redissolved on agitating the solution. The *sulphate* likewise gives peroxide, but the *chloride* and the *cyanide* are only very slowly acted on.

Palladium Salts.—The nitrate, chloride, and protoxide give the dioxide by the action of ozone. The protoxide, in presence of potassium hydroxide, gives potassium palladate.

Cobalt and Nickel Salts.—The sulphates, nitrates, and chlorides are but slowly attacked. The protoxides, on the other hand, are easily converted into peroxides.

Lead Salts.—All the basic salts give lead peroxide, as do many of the neutral salts; the chloride, nitrate, oxalate, and phosphate, however, are but very slowly acted on. Lead oxide is also changed into peroxide by ozone; in presence of potassium hydroxide, it gives potassium plumbate.

Manganese Salts.—All the manganese salts, in moderately concentrated solution, give a brown or black precipitate, consisting of the hydrated dioxide if the ozone is in excess, and of a lower oxide if it is not. In the former case a violet solution, containing permaganic acid, is frequently produced. If excess of ozone acts on a very dilute solution of a manganous salt (in 30,000 to 60,000 of water), a brown dicroic solution is obtained, which slowly decomposes after a time, depositing a rusty brown precipitate, and leaving permaganic acid in solution.

Chromic Salts.—The sulphate, chloride, and oxide all yield chromic acid. If ether is present, perchromic acid is formed.

Bismuth oxide gives bismuthic acid, and in presence of potassium hydroxide potassium bismuthate.

Iron sesquinoxide is not acted on by ozone, but in presence of potassium hydroxide it yields potassium ferrate.—Amer. Jour. Phar., Dec. 1882, 617–618, from Compt. Rem., 94, 850–863, through Jour. Chem. Soc., Nov. 1882.

HYDROGEN.

Water—Test Solution for Hardness.—Mr. C. R. C. Tichborne observes that the process for determining the hardness of water, originally invented by Dr. Clarke, nearly half a century ago, has never been improved upon, and that there seems at the present time no necessity for a change. He, however, proposes a modification in respect to the soap solution, which consists in preparing it from oleic acid, and standardizing it to the amount of volumetric soda solution required to neutralize the fatty acid. The following is the process:

5 cc. of oleic acid are measured with a pipette, and 50 cc. spirit added to it in a beaker; 2 drops of phenol-phtalein solution are also added, and immediately a volumetric solution of soda $\left(\frac{NaHO}{1000}\right)$ is run in until a pink indication is produced. This must be done accurately, as the success of the process depends upon this measurement. The oleate of soda is then made up to the required measure, *i. e.*, 820 cc. for 15.5 cc. of soda solution used—by the addition of a mixture of equal parts of rectified spirit and distilled water. Such a solution makes a lather exactly on the original scale of Clarke; and, although different oleic acids might differ in purity, such a condition of things introduces no error, as the volumetric soap solution is made up in the saturating power of the acid employed, which alone determines the strength. In the author's experience 15.5 cc. of soda solution neutralized 5 cc. of oleic acid, both of known purity and from the candle manufacturers.

The above process gives a solution, 32 cc. of which when operating on 100 cc. of water, represent 16° of hardness per gallon by Clarke's scale.—Yearbook of Pharm., 1882, 424–427.

Water—Formation of a Definite Compound with Carbonic Acid, which see under "Carbon."

Hydrogen Peroxide—Action on Organic Matter.—MM. Paul Bert and P. Regnard have studied the action of hydrogen peroxide upon various forms of organic matter and upon fermentations, and find that it possesses very remarkable antiseptic properties. The results of their investigations may be summed up as follows:

1. Hydrogen peroxide, even when very dilute, arrests fermentations due to the development of living organisms, and the putrefaction of all substances which do not decompose it.

2. It has no effect upon diastase fermentations.

3. Dilute hydrogen peroxide is not destroyed by fats, starches, soluble ferments, egg albumen, casein, the peptones, creatine, creatinine or urea.

4. It is rapidly destroyed by nitrogenous collagens, by musculin, fibrin of the blood, and various nitrogenous vegetable matters.

5. This action is definitely arrested by a temperature above 70°. Putrefaction, however, leaves it entirely intact.

As it appeared from the powerful antiseptic properties of hydrogen peroxide that it might prove of value in surgery, experiments were made upon the point by MM. Péan and Baldy at the hospital of St. Louis, with very successful results. The hydrogen peroxide, in solutions containing from two to six times its volume of oxygen, according to the circumstances of the case, was used, both externally, as a dressing for wounds, ulcers, etc., and also given internally in certain affections, in doses of from three to five grains, containing six times its volume of oyxgen. M. Bert draws attention to the fact that hydrogen peroxide for surgical use must be entirely neutral.—Amer. Jour. Phar., Jan. 1883, 21–22, from Compt. Rend. 94, 1383, and 95, 49, through Amer. Chem. Jour.

Oxygenated Water—Antiseptic Action.—Dr. Péan has made experiments on the antiseptic action of oxygenated water. Water containing from two to twelve times its volume of oxygen was used as a dressing after major operations, such as amputation of the arm, leg and thigh, etc., a spray of the same liquid being also played on the wound during the operation. Under the influence of these applications, the wound showed a favorable tendency to unite by first intention; and in the case of chronic ulcers, cicatrization was observed to be effected more rapidly than with any other dressing. Salutary results were also obtained when oxygenated water was given internally to patients who had been treated by other means, and who were threatened with septicæmia.—New Rem., Oct. 1883, 310, from Med. Press.

Sulphuretted Hydrogen—Improved Apparatus.—Mr. Clemens Winkler describes an apparatus which he considers to be the best and most serviceable in use. A leaden cylinder, securely fastened in a wooden frame, is intended for the reception of the acid, and it is provided, for this purpose, with a tubulure; its lower end has a conical shape, and terminates in a pipe, which is connected by means of a rubber tube and suitable pipes with a cistern, located underground, or in some other convenient place, and intended to receive the saturated solution. Within the cylinder, another narrower leaden cylinder, may be raised or lowered by means of a winch and pulley. This cylinder is filled to near the top with sulphide of iron. It fits snugly to the outer cylinder, and is arrested from complete descent in the latter by means of a collar. At its upper end it is provided with a lateral tubulure and stop-cock, which is connected with two wash-bottles, the first of which is intended for washing the gas, and the second for affording a constant supply of hydrosulphuric acid water, which may be drawn off from a faucet at the bottom. The top of the cylinder is closed by a round disk of thick rubber, and over this by a flat disk of iron securely clamped on, making a perfectly tight gas joint. The stirrup carrying the inner cylinder runs in grooves situated in the uprights, and is, therefore, raised and lowered with perfect ease, and without warping the joints. When it is desired to generate gas, the inner cylinder is lowered into the acid, and the generation ceases by again raising it.—New Rem., Oct. 1882, 295, from Zeitsch. f. Anal. Chem., 1882, 386.

Sulphuretted Hydrogen—Decolorizing Operation.—Mr. Bellucci has experimented on the action of sulphuretted hydrogen on various vegetable coloring matters, and has arrived at the following conclusions: 1. Sulphuretted hydrogen possesses powerful decolorizing properties, varying, however, according to the substance acted upon. For some substances (litmus, indigo) its decolorizing power is greater than that of sulphurous acid; for others (the coloring matter of roses), it is less. 2. The decolorizing power is due to the formation of a somewhat unstable compound of the sulphur with the various coloring matters, this compound being sometimes precipitated, and then slowly decomposed by the joint action of water and atmospheric oxygen.—Jour. Chem. Soc., July 1882, 781, from Gazz. Chim. Ital.

NITROGEN.

Nitric Oxide—Preparation in Large Quantities.—According to D. E. Johnstone, nitric oxide can be prepared in large quantities by heating 4 parts of sulpho-cyanide of potassium and 1 part of nitrate of cobalt, either in solution, or in the solid state slightly moistened with water.—Jour. Chem. Soc., July 1882, 692, from Chem. News.

Hyponitrous Acid—New Method of Preparation.—The methods of preparing hyponitrous acid by the reduction of nitrate or nitrite of sodium with sodium amalgam, or by the electrolysis of these salts with mercury as a negative electrode, are costly, and involve a considerable expenditure of time. Mr. W. Zorn now finds that freshly precipitated ferrous hydroxide reduces nitrates and nitrites readily. Hyponitrite of silver may readily be obtained by this means. Ferrous sulphate is precipitated with milk of lime; the thick part is added to a solution of nitrite of sodium, and the whole is left in a cool place; the solution is then filtered, and the filtrate, after neutralization with acetic acid, is precipitated by nitrate of silver, which throws down pure hyponitrite of silver. From 1 kilo ferrous sulphate and 100 grams nitrite of sodium, about 10 grams of the silver salt were obtained.—Jour. Chem. Soc., Oct. 1882, 1027, from Ber. d. Deutsch. Chem. Ges., 15, 1258–1259.

Nitric and Nitrous Acids.—Formation from Ammonia.—Prof. S. Kappel has studied the reactions involved in the formation of nitric and nitrous acids when copper and ammonia are allowed in contact, and, after giving the details of his researches, communicates the following conclusions:

(1) The conversion of ammonia, in the presence of copper and access of air or oxygen, into nitric and nitrous acid, while taking place in the cold, is much accelerated by heat, the ammonia being in both cases completely oxidized by prolonged reaction.

(2) Such acceleration of the process of oxidation is attained also in the cold, if the reaction takes place in a current of carbonic acid, because carbonates are thereby formed.

(3) When air is completely excluded, the oxidation of ammonia in contact with copper cannot be demonstrated with certainty.

(4) Zinc and iron in contact with ammonia and in presence of air may also cause the formation of nitrites, but their action is much weaker than that of copper. This may be explained possibly in that the hydrogen developed in status nascenti, partially reduces the nitric and nitrous acids formed. It is possible that by the oxidation of ammonia in contact with zinc, a double nitrite, analogous to the cupro-ammonic nitrite, is formed.

It is presumable that other metals, besides the three named, may possess the property of forming nitrites in contact with ammonia and air.—Arch. d. Phar., Aug. 1882, 567–573.

Ternitric Acid—Conditions of Formation.—Hautefeuille and Chappuis, who announced the fact, some time ago, that when the electric spark is passed through a mixture of nitrogen tetroxide and oxygen, the red color of the mixture disappears and a colorless gas remains, have still further investigated the matter. They find that the electric spark will develop the same compound from a dry mixture of oxygen and nitrogen gases. That the new compound is not nitric oxide, N_2O_5, is recognized by the fact that it cannot be gotten crystallized or in the solid form at all, as nitric oxide readily can be. They find, moreover, that this new compound forms up to a maximum amount from the action of the spark upon the mixture of gases, and after that the combination just made is broken up and nitrogen tetroxide and free oxygen remain. This maximum amount is dependent upon temperature, the lower the temperature the larger being the amount. They do not, as yet, propose any formula for it.—Amer. Jour. Phar., Aug. 1882, 395, from Comptes Rendus, 94, 1111.

SULPHUR.

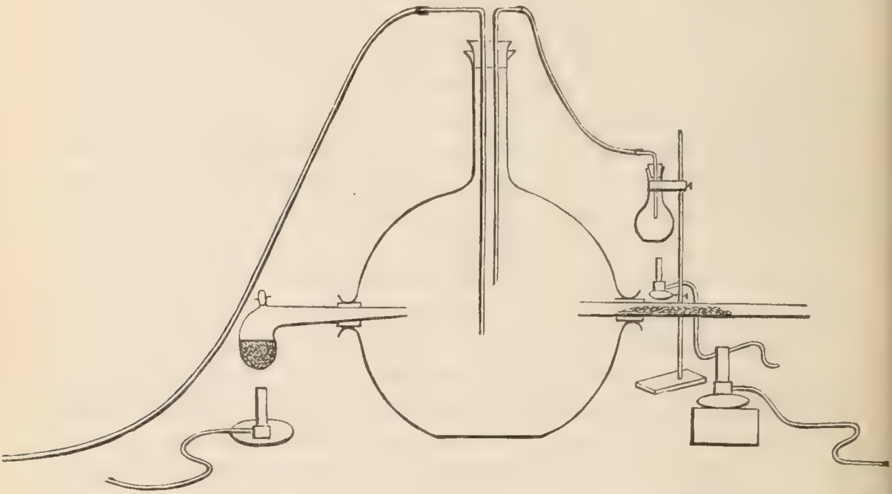
Sulphur—Estimation in Pyrites.—F. Bockmann recommends that 0.5 gram of the finely-powdered pyrites be fused in a large porcelain basin with 25 grams of a mixture of 6 parts Na_2CO_3, and 1 part $KClO_3$; the fused mass is then dissolved, the solution acidified, and precipitated with chloride of barium.—Jour. Chem. Soc., Sept. 1882, 993, from Zeitsch. Anal. Chem., 1882, 90.

Sulphurous Acid—Use in form of Alcoholic Solution.—Mr. John Gamgee proposes to use the *alcoholic solution of sulphurous acid*, a product which he considers well worthy the attention of medical practitioners. This solution contains three hundred times its volume of sulphurous acid. It is therefore a means of procuring very large quantities of this useful agent, hitherto so little employed, in a very small bulk, and supplies us with a valuable medical and hygienic agent.—New Rem., Feb. 1883, 52.

Sulphurous Acid.—Detection in *Wine*, which see under Materia Medica.

Sulphuric Acid—Improved Apparatus for Illustrating its Manufacture. Mr. Alfred Senier describes the apparatus employed by him for several years for illustrating the manufacture of sulphuric acid, which apparatus is simpler and more easily constructed than that of Roscoe and Schorlemmer, employs burning sulphur as a source of sulphuric anhydride, and is regarded by the author an important advance on the methods generally recommended and employed in teaching. The apparatus is shown by Fig. 37. Through a cork in one neck of the flask (of about a gallon capacity) is passed the neck of a small retort, containing nitre and sulphuric acid; through a similar cork in the opposite neck is passed one end of a piece of combustion tube, containing fragments of sulphur, and open at both ends; through the cork at the mouth of the flask are passed two tubes, one connected with a small flask, in which water is boiled, and the other connected with an aspirator—preferably a gas-holder full of water. Some of the sulphur in the combustion tube is heated to just about the melting-point, when it ignites on a gentle current of air being caused to flow over the sulphur into the flask by means of the aspirator. Once started, the sulphur continues to burn by the heat of its own combustion, so long as the current of air is maintained. If it is wanted to introduce air, it can be easily done without an extra tube, by stopping the aspirator a minute, when the burning sulphur is extinguished, and cooling below the ignition point, a flow of air passes over it through the combustion tube when the aspirator is again turned on. The sulphur can again be raised to the ignition point by momentary application of the Bunsen flame. In other respects, the mode of working is sufficiently obvious.—Phar. Jour. Trans., Oct. 21, 1883, 321.

FIG. 37.



Apparatus for Illustrating the Manufacture of Sulphuric Acid.

Sulphuric Acid—Volumetric Determination.—A. Guyard prepares a normal solution of lead nitrate by dissolving an equivalent (in grams) of this body in a liter of water. The solution containing sulphuric acid, sulphates, or a mixture of both, is placed in a burette graduated into tenths of a cc. There are poured into a beaker, provided with a stirrer, 25 cc. of the normal lead solution, and it is colored a bright yellow by means of some drops of potassium iodide. Pour, then, gradually and stirring incessantly, the sulphuric solution from the burette till the liquid in the beaker is completely decolorized. The number of divisions employed corresponds exactly to the weight of sulphuric acid necessary to precipitate 25 cc. of normal solution of lead nitrate. This process is advantageous chiefly for determining the total acid. If it is desired to determine both the free and the combined acid, the best process is the following : Total acid is determined as above, and the free acid is then found by means of a standard ammoniacal solution of copper. The difference is the combined acid. These processes are recommended only when there is no other free acid except the sulphuric, and when the liquids in question contain mere traces of chlorides.

The author obtains oxygen in the cold by the action of concentrated nitric acid upon potassium permanganate. The gas is given off with great regularity, and if washed in a weak alkaline solution is absolutely pure.—New Rem., Mar. 1883, 81, from Mon. Scient., through Chem. News.

Sulphuric Acid—Determination in Presence of Alkaline Chlorides.—The influence of nitrates on the precipitation of barium sulphate has already been studied by Fresenius, and he recommends warming the ignited precipitate with hydrochloric acid and washing with hot water. After filtration, the filtrate is evaporated to dryness to separate dissolved barium sulphate, the latter added to the rest of the precipitate, and the whole weighed. By this means the nitrates are removed ; but he does not enter into the question as to whether chlorides are also to be found in the precipitate. In the estimation of sulphur in organic substances by fusion with potash and salpetre, excess of alkaline salts is always present ; when they are in the form of nitrates, the precipitated barium sulphate will have to be purified by the above method. B. Schulze, however, prefers to convert the nitrates into chlorides by heating to dryness with hydrochloric acid. Upon re-dissolving and filtering, the sulphuric acid is precipitated by a little barium chloride, and the precipitate, after filtration, ignited alone, and finally with sulphuric acid, and weighed in the usual manner. A precipitate obtained in this way was treated with a few drops of hydrochloric acid, and then with boiling water, and filtered. The filtrate showed quite a strong sulphuric acid reaction with barium chloride, which could only have arisen from the presence of alkaline sulphates in the precipitate, and was of course due originally to the coprecipitation of alkaline chlorides. In general, about three per cent. of the original precipitate was removed in this manner. To ascertain whether barium sulphate was also removed in any quantity by this process, so as to necessitate the evaporation of the wash-water, as in Fresenius' method, further portions were treated two or three times with hydrochloric acid, and the change of weight in each case noted. The loss by the second and third treatment was, however, found to be so small that it could be neglected, but one treatment with acid seems to be essential in all cases where excess of alkaline chlorides is present.—New Rem., May 1883, 152, from Landw. Versuchs-Stat., 28, 161.

Sulphuric Acid—Delicacy of the Barium Test.—According to Mr. Spencer Pickering, experiments made to determine the delicacy of the barium sulphate test gave the following results: The minimum strength of a solution of barium chloride in which the barium could be detected with certainty was found to be one containing 0.0000012 grm. of barium (= 0.00000135 grm. BaO) per cc., or 1 part of barium in 833,000 parts of water. As the cloudiness produced can easily be seen with 2 cc. of the liquid, it follows that the actual amount of barium which can thus be detected is 0.0000024 grm.; equal to 0.0000027 grm. BaO.

In the testing sulphuric acid was used; the reaction did not appear to be rendered more delicate by using alkaline ammonium sulphate; the reagents were left in contact for five or ten minutes before the result was examined.

The best results are obtained by placing an artificial light almost vertically above the test tube containing the liquid, and a black background behind, allowing the light to fall on a portion only of the liquid.—New Rem., Mar. 1883, 81, from Chem. News., Nov. 17, 1882.

CHLORINE.

Chlorine—Action upon Solution of Carbonate of Sodium.—Messrs. Wyndham R. Dunstan and F. Ransom, in connection with their experiments upon the constitution of "liquor sodæ chloratæ, B. P.," (which see under "Pharmacy,") have studied the action of chlorine upon solutions of sodium carbonate. They find that the first action of chlorine upon such solution at ordinary temperatures, and at lower temperatures, even to the freezing point of water, results in the production of sodium hypochlorite, chloride, and bicarbonate. When more chlorine is passed through this solution, the sodium bicarbonate is not appreciably affected at first, but the sodium hypchlorite is decomposed with the production of hypochlorous acid; but as the passage through the chlorine is continued, effervescence occurs, the bicarbonate is decomposed, and the final constituents of the solution are sodium chloride, and hypochlorous acid. The liquid also contains some sodium chlorate, which is doubtless produced by the action of hypochlorous acid upon sodium chloride.—Phar. Jour. Trans., Feb. 17, 1883, 668-669.

Chlorate of Potassium—Effect of Glycerin on the Saturated Watery Solution.—Fred. Grazer observed that a mixture of saturated solution of potassium chlorate (1 to 16) and glycerin, remains clear for a short time only, and then deposits crystals of the chlorate, unless a small portion of water is added.—Amer. Jour. Phar., May 1883, 270, from Proc. Cal. Phar. Soc., 1883, p. 50.

BROMINE.

Bromine—Apparatus for Continuous Manufacture.—The following description of an apparatus for the continuous manufacture of bromine will be found of particular interest to manufacturers of that article, but instructive also to pharmacists.

The hot bromine-lye is conducted by a pipe into an earthen-ware drum, occupying the full width of the tower, and provided with obliquely downward-directed openings. Below the drum is a plate of sandstone into which are cemented small slightly conical clay tubes. The lye is thus evenly distributed upon the glass balls with which the tower is filled. Chlorine gas is conducted from a generator into the tower and the supply is regulated by a bent glass tube. A rubber tube connects the bend of the latter with a perpendicular descending arm of the pipe conducting the chlorine, the object of which arrangement is to permit the water condensing in the glass tube to flow off into the wash apparatus. Whenever the current of chlorine gas becomes stronger, more water is driven out. and the force of the current may be estimated by the size of the passage left for the gas in the bend. If it is desired to interrupt the current of the gas, the tube is detached from the side-arm, and enough water poured into it, until the bend of the glass tube is completely filled. Whatever gas passes into the wash apparatus, is conveyed from there again into the tower.

The lye collects under the perforated bottom, and flows into a vessel, where the dissolved chlorine and bromine are expelled by steam. The lye is made to flow over alternate shelves of sand-stone, and passes finally into the waste. Steam enters through the stone pipe, and from there, passing through holes in the shelves of sand-stone, permeates the lye. The latter, constantly boiling, fills the apparatus up to a pipe, the obliquely-cut end of which leaves barely room enough for the passage of the current of gas. The vapors of bromine which ascend in the tower are conducted through an earthen-ware pipe to the earthen-ware worm in the condenser, and the liquid bromine passes into a bottle. Any uncondensed vapors pass into an earthenware tube, which dips into a vessel from which the excess of liquid flows off automatically without exposing the lower end of the tube. This is filled with iron filings, which are kept moist by a current of water. All chlorine and bromine here combines with iron, and the resulting salts being dissolved in the water, are constantly removed.

Vapor of water and air find their exit through an opening.—New Rem., April 1883, 108, from Chem. Ztg.

Hydrobromic Acid—Preparation.—Mr. Thomas S. Wiegand recommends the following convenient process for preparing this acid: Having a flask fitted with a cork, which is perforated to receive a tube reaching just below the cork and rendered tight by waxing it, connect it by means of a piece of gum tubing with another tube bent at right angles; let the lower end of this tube dip to the bottom of a vessel which is shaped like a glass percolator, and, in fact, a glass percolator is the best for the purpose, and this is closed at the bottom with a rubber stopper, and fitted with a close-fitting cap, through which the bent tube passes, and also another to prevent the gas from blowing off the cap. When these arrangements are made, a quantity of sulphide of iron is placed in the flask with some diluted sulphuric acid: this will supply the hydrogen sulphide. The bromine and water having been placed in the percolator, the gas is permitted to pass through it until all the bromine has been converted into hydrobromic acid, which will be indicated by its loss of color and of the peculiar odor of bromine; the solution is then filtered from the sulphur and concentrated to the specific gravity of 1.077, which corresponds with a ten per cent. solution, this being the strength indicated by the Pharmacopœia of 1880.—Amer. Jour. Phar., April 1883, 164–165.

Bromide of Potassium—Presence of Chloride in Commercial Samples.—Mr. Julius Way observes that commercial bromide of potassium is always contaminated with chloride, it being impossible to entirely free the bromine, from which it is prepared, from chlorine, without increasing the cost of the salt to a considerable extent. About 2 % of chloride must usually be admitted in the commercial salt. The author determined the amount of chloride in different samples to be as follows: 1.10, 1.39, 1.55, 1.97, 2.24, 2.25, 3.44, 4.88, 5.98 and 6.92, or for ten samples an average of 3.17 %.—Amer. Jour. Phar., Oct. 1882, 483–4.

IODINE.

Iodine—Manufacture in Peru.—Mr. Robert Harvey describes his plant for the manufacture of iodine from the nitrate deposits (*caliche*) of Peru. The plant cost originally 23,000 dollars Chilian currency, and the outcome is about 3,500 pounds of sublimed iodine per month. The description will be found valuable to those contemplating a similar venture. New. Rem., Nov. 1882, 341.

Pentabromide of Iodine.—Preparation and action on volatile oils, which see under "Organic Chemistry."

Iodide of Potassium—Volumetric Estimation.—Mr. P. Carles finds the volumetric method of Personne for the estimation of iodide of potassium to give perfectly satisfactory results when, in the place of water, 17.5 per cent. alcohol is employed for the solution of the iodide of potassium and mercuric chloride. Mixtures were prepared containing small amounts of iodate, carbonate, chloride and bromide of potassium, and subjected to the modified method. The results prove it to be very correct. Amer. Jour. Phar., Febr. 1883, 89, from Chem. Zeitg., No. 81, 1426, au Giorn. Farm. Chim., 31, 481.

Ammonium Iodide—Modification of U. S. P. Process.—Mr. John A. Lambert discusses the various methods which have been proposed, and arrives at the conclusion that acceptable results are obtained by the process adopted by the U. S. Pharmacopœia of 1870, provided the error be corrected in the relative proportion of potassium iodide and ammonium sulphate, so that for 332 parts of the former 132 parts of the latter salt are used. It is further suggested that the salts be dissolved separately in cold instead of boiling water, and that in the evaporation to dryness the liquid be kept alkaline by the occasional addition of ammonia; with these modifications the process will yield an uncolored salt, which, however, is more deliquescent and more readily decomposed on exposure than the salt prepared from pure hydriodic acid and ammonia. Made by the latter process, the salt will cost about 50 per cent. more than when prepared by the modified officinal formula; it is then white and granular, and on exposing small quantities for one or two weeks in a rather moist atmosphere, they remained dry and only began to show signs of deliquescence at the end of that time.

The author also communicates the results of examination of ten commercial samples of the salt, which, with one exception, gave satisfactory results.—Amer. Jour. Phar., Oct. 1882, 482–3.

Iodate of Potassium.—Used for preserving *Tincture of Iodine* in a normal condition. See *Tinctures*, under "Pharmacy."

PHOSPHORUS.

Pentasulphide of Phosphorus—Boiling Point.—Mr. H. Goldschmidt has determined the boiling point of pentasulphide of phosphorus. One preparation boiled at 519° at a pressure of 734 mm., and a second at 517° at a pressure of 728.5 mm.—mean, 518°. This value differs from that (550°) obtained in former determination, the difference being due to impurities consisting of higher boiling sulphides of phosphorus, which were rigorously excluded in the present experiment.—Jour. Chem. Soc., July 1882, 693, from Ber. d. Deutsch. Ch. Ges., 15, 303–304.

Phosphoric Acid—Saturation by Bases.—Operating with "methyl-orange" and "helianthine" as indicators instead of litmus, Mr. A. Jolly finds that 1 equivalent of phosphoric acid is perfectly neutralized by 1 equivalent of an alkali (potash, soda, or ammonia). Solutions of phosphates, which strongly redden litmus, are neutral to helianthine.

Hence it would appear that the first equivalent of alkali behaves with phosphoric acid exactly as with a true *monobasic* acid, and confirms the conclusions drawn by Berthelot and Longuinine from their thermo-chemical experiments.—Jour. Chem. Soc., July 1882, *692*, from Compt. Rend., 94, 529, 531.

Phosphoric Acid.—Formation of a *New Sodium Salt*, which see under "Sodium."

BORON.

Boric Acid—Solubility in Glycerine.—Mr. David Hooper, after detailing the difficulties encountered in determining the solubility of boric acid in glycerin at different temperatures, describes the method, and gives the following table exhibiting his results:

Solubility of Boric Acid in 100 parts (by volume) of Glycerin from 0° to 100° on the Centigrade Scale.

20 parts	0°
24 "	10°
28 "	20°
33 "	30°
38 "	40°
44 "	50°
50 "	60°
56 "	70°
61 "	80°
67 "	90°
72 "	100°

—Yearbook of Pharm., 1882, 501–504.

Boracic Acid—Estimation as Borate of Manganese.—Edgar F. Smith observes that when a solution of manganese sulphate is added to one of borax, and to this mixture an equal volume of alcohol, there separates rapidly a white, flocculent precipitate of manganese borate, MnB_4O_7, insoluble in the alcoholic liquid. The excess of manganese sulphate remains in solution, and can readily be determined in the filtrate from the borate after the expulsion of the alcohol. To ascertain whether the above might be available quantitatively, the following solutions of definite strength were prepared and the experiments recorded:

1. A solution of manganese sulphate, made by dissolving 3 grams of anhydrous $MnSO_4$ in 250 cc. H_2O. 10 cc. of this solution would then cotrespond to .0600 gram $MnSO_4$.

2. Potassium permanganate solution of such strength that 18.5 cc. were equivalent to 10 cc. of I or 1 cc. $KMnO_4 = .00324$ gram $MnSO_4$.

3. Borax solution: 10 grams well-crystallized borax dissolved in 1 liter of H_2O.

The manner of conducting each experiment was as follows: To 10 cc. of the borax solution were added 10 cc. $MnSO_4$ solution and an equal volume of strong alcohol. The whole was well mixed, allowed to stand, carefully covered, for one-half hour, when the manganese borate was filtered rapidly (best with a suction pump) and washed well with alcohol. The filtrate and washings were placed in a platinum or porcelain dish and evaporated to dryness on a water-bath. The residual manganese was then determined according to Volhard's method, by dissolving it in water, adding zinc sulphate, then heating to almost boiling, and carefully running in potassium permanganate until the liquid assumed a pink color. The quantity of manganese sulphate thus found, deducted from the whole amount of the salt added, gave a difference representing the manganese sulphate which had combined with the borax. After calculating the amount of manganous oxide to which the sulphate, found by difference, is equivalent, the following equations were employed:

$MnO : 2B_2O_3 :: \text{amount } MnO : \text{corresponding amount } B_2O_3\ (x)$; and

Orig. sub. 10 cc. borax solution : $x :: 100 : y$ (per cent. B_2O_3 in 10 cc. of the borax solution).

The calculated percentage of B_2O_3 in borax is 36.60, and the experimental results recorded show that the method can be successfully applied in the analysis of soluble borates.—Amer. Jour. Phar., Jan. 1883, 39–40, from Amer. Chem. Jour., Oct. 1882.

Borax.—Reaction with *Glycerin*, which see under "Organic Chemistry.

SILICON.

Silicate of Sodium.—Use in the Preparation of Cheap *Soaps*, which see under "Pharmacy."

Asbestos—Preparation for Filters.—Some years ago (1875*), Mr. Cassamayer had given directions for preparing asbestos filters, but neglected to give directions for the preparation of the asbestos, which he does now, as follows:

Whatever may be the kind of asbestos used, the following is a process for obtaining, with little trouble, a quantity of the pulp in a fit state for filtration:

A coarse brass sieve is placed over a sheet of paper, and a handful of asbestos is rubbed pretty roughly over the sieve cloth. This breaks it up in such a way that the smaller fragments pass through the meshes, and are deposited on the paper underneath. After awhile the portion which remains on the sieve cloth is collected in one bundle, and rubbed again in the same manner, and the operation is repeated until a sufficient quantity has gone through. In a few minutes enough of the material is obtained to last for months.

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*See "American Chemist," v, p. 44. "Chemical News," xxxii, p. 46.

As to the coarseness of mesh to use, the author has used No. 10 sieve (ten openings to the inch) with satisfactory results. The sieve is best placed bottom up, so as to leave plenty of room under the cloth.

The next operation is to free the sifted material from dust and from the finest particles. This is easily accomplished by placing the asbestos, as obtained above, over another sieve of finer mesh (about No. 25 or No. 30), and stirring it while water is poured over the sieve. The first water which passes through it is quite milky, but it gradually becomes clearer as the washing is continued. The washed asbestos is then put in a beaker glass, and boiled for about half an hour with strong hydrochloric acid (about 1 part of fuming HCl to 4 parts of water).

The pulp, after this treatment, is poured over a perforated platinum plate, placed in a funnel, and washed with distilled water until no acidity is shown by litmus paper. The pulp is then taken out of the funnel and strongly heated in a platinum dish. After letting it cool sufficiently, it may be placed in a wide-mouth bottle for future use.—Amer. Jour. Phar., Jan. 1883, 37-38, from Jour. Amer. Chem. Soc., Nov. 1882.

Glass—Solubility in Certain Reagents.—Mr. Richard Cowper has made a series of experiments which conclusively show that solution of ammonia and of ammonium sulphide are capable under certain conditions to dissolve appreciable quantities of glass. While solution of ammonia of sp. gr. 0.88 scarcely attacks glass when kept at 100° C. for six days in sealed tubes, dilute solution of ammonia, sp. gr. 0.982, attacks it very considerably, and such a solution exercises a maximum effect. A concentrated solution of ammonium sulphide attacks glass to very nearly the same extent as the dilute solution of ammonia, and the dilute solution of ammonium sulphide has more effect than the concentrated reagent.—New Rem., Aug. 1882, 244, from Jour. Chem. Soc., 1882, 254.

CARBON.

Disulphide of Carbon—Purification.—Some time ago, E. Allary (see Proceedings 1882, 284) proposed to purify disulphide of carbon by shaking it with an aqueous solution of permanganate of potassium, and subsequent washing. This announcement induced Eugen Obach, who had previously used this method without success, to study the behavior of the two substances upon each other, under varying circumstances. After describing the action of permanganate of potassium on disulphide of carbon under three different conditions, he gives his method for purifying commercial disulphide of carbon. This method is mainly suitable for purifying smaller quantities for use in laboratories, and may not be quite applicable on a large scale, since it is somewhat circumstantial. But it will always furnish a pure product, unless very abnornal impurities should be present.

The crude liquid is first separated from any water which may be present, freed, by means of a dry filter, from mechanical impurities, and at once filtered into a capacious flask, in which a few pieces of burnt lime are contained. The liquid is next distilled from a water-bath heated to 70°–80° C., until only a small residue remains, which contains nearly all the free sulphur and a portion of the fetid oils. The distillate, in most cases, contains sulphydric acid, caused by the decomposing action of the lime upon some of the foreign sulphur compounds; besides, some fetid oils and a trifle of free sulphur. It is now shaken with coarsely powdered permanganate of potassium (about 5 gm. per liter), and left in contact therewith for some time, *until the sulphydric acid is removed.* The liquid poured off from the permanganate contains still some of the sulphurated oils, and a little *more* sulphur than before the treatment with permanganate. It is now briskly shaken, in a stoppered glass, with a small quantity (a few cc. per liter) of pure mercury, *until all free sulphur is combined;* next, 25 gm. of mercuric sulphate (per liter of disulphide) are added; and the whole mixture again shaken. The reason of this mode of manipulation is this, that the mercuric salt acts more rapidly and easily upon the sulphurated oils, if the free sulphur has previously been removed. A still better way is to pour off the disulphide from the metallic mercury before treating it with the salt. The odor will indicate when *all the fetid sulphurated oils have been removed.* The disulphide is now poured off from the salt into a flask containing some pieces of porous chloride of calcium, and distilled immediately into the bottle in which the pure product is intended to be kept. The bottle must be perfectly dry, and provided with a well-ground stopper. During the last operation, daylight should be excluded. A very good way is to keep the disulphide in bottles (say of about five pint capacity), which are themselves kept in tin boxes, blackened internally. On pouring out a little of the liquid, only the lid of the box is removed, and light can strike only a small portion of the liquid.

It is particularly to be observed that the above described processes must be performed in the precise order mentioned, since each successive manipulation is intended not only to remove an impurity already present in the disulphide, but, at the same time, also the impurity produced by the previous reagent.

The author fears to trust to the method of purification recommended by Friedburg,* viz: shaking with fuming nitric acid, since he suspects that the disulphide will obstinately retain at least traces of acid vapors.

Disulphide of carbon contaminated with sulphydric acid—but otherwise pure—acts with comparative rapidity upon metallic silver, mercury, and copper, *in presence of air*, with formation of the corresponding sulphides. If air is excluded, silver remains entirely unaffected, mercury is but very slightly affected, but copper is always distinctly colored. If disulphide of carbon, containing sulphydric acid, is to be tested for free sulphur (the latter being present only in small quantity), this should be done in a perfectly filled bottle with exclusion of air. In this case, the blackening of metallic mercury does not proceed from the sulphydric acid, but from the free sulphur. Alkaline solutions of lead-salts decompose the vapor of the disulphide (and also various allyl-compounds) after a longer or shorter period, with formation of sulphide of lead. Hence they cannot be employed as reagents for sulphydric acid.—New Rem., Jan. 1883, 21, from Journ. f. prakt. Chem., 26, 299.

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* Ber. d. Deutsch. Chem. Ges., 1875, 1,616; 1876, 127.

Carbonic Acid—Compound with Water.—From certain phenomena observed in a tube in which carbonic acid gas is compressed in presence of water, Mr. S. Wroblewski infers the existence of a definite but readily dissociable hydrate, capable of existing only under certain pressure, increasing with the temperature, and equal to 12.3 atmospheres at 0°.—Jour. Chem. Soc., July 1882, 692, from Compt. Rend. 94, 212–213.

Carbonic Acid—Amount in the Atmosphere.—Mr. Dumas contributes a review of past and recent investigations on the amount of carbonic acid in the atmosphere, in which he lays special stress on its constancy. He points out the importance of making observations in different parts of the world with a view to determine the variations in the proportion of carbonic acid caused by great atmospheric movements. He considers that the quantity of carbonic acid produced by combustion and the respiration of animals, and the quantity removed by the action of plants, cannot be compared in point of magnitude with that derived from subterranean sources, and that removed as carbonate of calcium and deposited at the bottom of the sea.—Jour. Chem. Soc., July 1882, 692, from Compt. Rend. 94, 589–594.

SODIUM.

Alkalimetry.—Phenacetolin (which see under "Organic Chemistry") an indicator.

Carbonate of Sodium.—Action of chlorine on its solutions. See *Chlorine.*

Sodium Sulphide—Manufacture.—The demand for sodium sulphide in connection with tanning, bleaching jute, for the preparation of certain pigments, etc., has led to the realization of a method for its industrial production by Mr. Helbig, which is described by Mr. W. Weldon in Phar. Jour. Trans., Dec. 16, 1882, 483–4. Mr. Helbig adds a certan quantity of black ash to a mixture of sodium sulphate and alkalii-wash, which he digests under pressure with water. The reactions which then take place no doubt take place practically simultaneously, but they may be most readily explained by supposing them to take place successively;

by supposing that water and calcium sulphide first react on each other, producing calcium hydrate and sulphydrate, that the latter then reacts on sodium sulphate, giving calcium sulphate and sodium sulphydrate, that the calcium hydrate then reacts on the sodium carbonate of the black ash, producing calcium carbonate and caustic soda, and that the caustic soda so produced and sodium sulphydrate then react upon each other, and are both converted into sodium sulphide. The sum of these reactions may be represented by the equation:

$$2\,CaS + Na_2SO_4 + Na_2CO_2 = CaCO_3 + CaSO_4 + 2Na_2S.$$

The operation is performed in iron digesters furnished with mechanical agitators—which are kept in motion throughout the operation—and heated by injection of steam (under a pressure of about 5 atmospheres). What is drawn off from the digesters when the operation in them is complete, is a solution of sodium sulphide holding in suspension various solid matters. These are separated by filtration, the filtrate evaporated to about 32° Beaumé, during which operation any salts other than Na_2S fall and are fished out, and the concentrated solution is then allowed to cool, when it gives crystals of the hydrated salt, Na_2S, $9H_2O$.

It is stated that sodium sulphide is a fusible body, and that the crystallized sulphide of sodium readily absorbs oxygen. Mr. Helbig finds that the latter body absorbs oxygen only very slowly, whilst Mr. Weldon has found that pure sulphide of sodium cannot be fused at all, on the large scale, inclosed vessels made of a material on which Na_2S has no chemical action.

Phosphate of Sodium—Preparation and Character of a Compound Neutral to Litmus.—Messrs. E. Filbert and Senderens add caustic soda very cautiously to a solution of phosphoric acid until the liquid is exactly neutral to litmus, evaporate the liquid at a gentle heat, and finally over sulphuric acid in a vacuum. In this way, oblique rhombic prisms are obtained, which contain 3 mols. H_2O, are neutral to litmus, and may be regarded as a combination of 1 mol. mono-sodium phosphate and 1 mol. disodium phosphate. The salt loses its water of crystallization at 110° C, without melting, and its water of constitution at 200° C. At a higher temperature it melts, and forms a transparent vitreous mass on cooling. A salt containing 15 mols. of water of crystallization, and melting at 55° C, is obtained by evaporating a solution in a current of dry air at the ordinary temperature. In order to obtain this salt, it is essential that the solution should be exactly neutral, the least excess of acid or base causing the separation of alkaline disodium phosphates from an acid mother liquor. The authors were unable to obtain the corresponding potassium and ammonium compounds.—Jour. Chem. Soc., July 1882, 693, from Compt. Rend., 94, 649–650.

AMMONIUM.

Gaseous Ammonia—Delicate Test Paper.—Kroupa dissolves fuchsine in water, and adds to the solution dilute sulphuric acid, whereby it becomes of a yellowish-brown color; the solution is then highly diluted, and strips of unsized paper moistened therewith, which are afterward dried. This test-paper, which is of a beautiful yellow color, is applied in the dry state, and is capable of detecting an amount of ammonia corresponding to 0.0005 gram of ammonium chloride; the yellow color becoming changed to a beautiful carmine-red.—Pharm. Zeitschr. für Russ., No. 50, 1882, from Zeitschr. für Analyt. Chem., xxi., p. 391.

Ammonia and Ammonium Sulphide.—Solvent action of their solutions on *Glass*, which see under "Silica."

Ammonia Water—Manufacture—Mr. Walter Clark describes an apparatus with which he is able to produce water of ammonia of a sp. gr. below 0.900, and containing 27% of ammonia, at a single distillation and from liquor of "five-ounce strength" (distillation test). The plant consists of two stills, one rectifier, and a system of three-quarter inch condensing pipes, cooled by evaportion of water sprinkled over them. The ammonia gas is absorbed by water, contained in a sheet iron cylinder holding about one hundred and fifty gallons. The two stills is are so connected that one may be emptied into the other, by opening a cock and another cock is used for admitting water to loosen the lime, which occasionally stops the connecting pipes between the stills. The contents of the second still are heated by means of a steam coil. The operation is as follows: the liquor in the second still having been exhausted of ammonia by means of heat from the steam coil, the still is emptied through a cock. Next the first still is emptied into the second, and enough lime for the absorption of the carbonic acid and sulphuretted hydrogen in the new charge is mixed with gas liquor in the lime box, and run into the first still. Now steam is turned on the coil in the second still, the vapors from the boiling liquor passing through a perforated pipe, extending from end to end of the upper still. After bubbling through the fresh charge in the first still, these vapors, now rich in ammonia, drain back into the upper still. By this method of working, gas liquor of any strength may be brought to yield vapors so rich in ammonia that the water condensing from them will not carry back with it to the still all the gas, but leave some to travel on to the absorbers. Starting with both stills containing "five-ounce liquor" and lime, it requires several charges to so enrich the vapors that any considerable amount of ammonia will reach the absorbers; but when this point is attained, each charge sends all its gas to enrich the water.—New Rem., Jan. 1883, 15.

BARIUM.

Sulphate of Barium—Separation by Filtration.—Mr. Henry C. Bruen gives some practical hints in reference to the separation of the precipitated sulphate of barium by filtration. If the solution of chloride of barium and of the sulphate to be acted on be boiled, the precipitate settles rapidly, and does not unfrequently pass through the filter, as in the case when precipitation is effected in the cold. The sulphate has the peculiar property of *crawling* up and over the edges of the moist filter. It is, therefore, necessary that the filter should fit closely to the sides of the funnel, and that it should not be filled very near the top.—Drug. Circ., Feb. 1883, 21.

Barium Salts.—Delicacy of the reaction with *sulphuric acid*, which see under "Sulphur."

STRONTIUM.

Strontium Salts—Detection.—Mr. F. Ransom records a series of experiments made to determine a good method for the detection of strontium, and sums up his results as follows:

First. That strontium salts in solution may be detected by the addition of neutral chromate of potassium, and the subsequent application of heat, provided that we are dealing with a simple solution of strontium nitrate not more dilute than .5 per cent.

Secondly. The presence of free acetic acid prevents this precipitation, especially in the cold.

Thirdly. This latter condition is not materially altered when the free acid is entirely neutralized.

Lastly. In the usual method for the detection of the three metals—barium, strontium, and calcium—care must be taken to add excess of acetic acid when dissolving the carbonates, in order that free acid may be present, and thus prevent the precipitation of strontium with potassium chromate.—Phar. Jour. Trans., Feb. 3, 1883, 626–627.

CALCIUM.

Chloride of Calcium—Disadvantages as a Desiccator of Gases.—Clemens Winkler has made the observation that the passage of *moist* carbonic acid gas over fused chloride of calcium is apt to lead to incorrect results, although the salt may have been exposed to a current of the dry gas for twenty-four hours previously, with a view to convert any caustic lime present into carbonate. This latter proceeding has been recommended by Fresenius and others, and it has hitherto been supposed to answer the purpose. But Winkler has found that the interior of the lumps is not reached at all in this way; only on gradual fusing will any caustic lime present (in the chloride of calcium) take up carbonic acid gas. If this takes place during an ultimate organic analysis where the chloride of calcium is intended merely to retain the water, and the carbonic acid gas caught separately in solution of caustic potassa, it will be seen that the results must be more or less inaccurate. Indeed, it would appear as if many analyses previously made must have suffered from this source of error.

Since it is impossible to remove this defect in the fused chloride of calcium, without rendering it useless for the intended purpose, Winkler proposes to abandon its use altogether, and to employ sulphuric acid exclusively.—New Rem., Jan. 1883, 22, from Zeit. f. Anal. Chem., 1882, 545.

Anhydrous Calcium Chloride—Character.—A. Weber shows that crystallized calcium chloride, on being heated to 200° C. (392° F.), parts with all its water, retaining only a minute quantity of it, and leaving a porous mass, which for most uses is far preferable to the granulated, frequently hydrated salt, and to the fused salt, which is too compact. The porous mass, obtained as stated, was found to contain 0.5 per cent. CaO, which amount by subsequent fusion was increased to 0.38 per cent. The calcium oxide results from a decomposition of the chloride by the last traces of water, hydrochloric acid being given off.—Amer. Jour. Pharm., June 1883, 308, from Berichte, 1882, p. 2316.

Calcium Iodide—Preparation.—Mr. R. Rother communicates the following formula and method for preparing calcium iodide:

Iron in fine wire	56 parts.
Iodine	381 "
Calcium carbonate	150 "
Water sufficient.	

Mix 56 parts or any moderate excess of iron wire with 1200 parts of water and 254 parts of iodine gradually added. When the reaction is completed and a light green solution is obtained, filter this and add to it the remainder of the iodine. Then, when this has all dissolved with the formation of a brown red solution, add the calcium carbonate (150 to 160 parts) by degrees, and warm the mixture when the effervescence slackens, until the evolution of gas has ceased and all the iron is precipitated. Let the dense precipitate subside, and decant the supernatant liquid. Mix the residue with enough water to restore the original weight; let subside, and again decant. Mix the two decantates, pour the solution upon a filter, and when all has passed through, pour the sediment into the filter and wash it with water until practically free from calcium iodide. Unite all the filtrates, and evaporate the mixture until a dense pellicle forms over the surface, and boiling continues only at a narrow vent. Now pour the fused salt into a shallow plate of suitable size, cover it well, and when cooled, detach the hardened mass, break it up and preserve it in well-stopped bottles.—Amer. Jour. Phar., May 1883, 227–231.

Creta Præparata—Presence of Gypsum.—Mr. F. Harris Alcock has had occasion to examine a specimen of "creta præparata," which occurred in cones of almost equal size, each weighing about 70 grains and measuring 1 1/8 inches in height, and about 7/8 inch diameter at the base. It was much lighter and whiter than the British Pharmacopœia variety, and had a satiny touch, free from grittiness. Subjected to chemical examination, it was found to be largely composed of sulphate of calcium ($CaSO_4$, 2 H_2O), the amount actually obtained as the mean of three analyses being 67.016 per cent.—Phar. Jour and Trans., June 9, 1883, 1015.

MAGNESIUM.

Magnesia—Separation from Lime, Ferric Oxide and Alkalies.—According to Dr. H. Hager, if one gram magnesia is treated with 80 cc. of a cold five-per-cent solution of oxalic acid, a clear solution is obtained, which, on boiling, deposits all its magnesia as magnesium oxalate. A very small portion of the precipitate is redissolved on cooling. If the magnesia is mixed with ten parts of glycerin before solution in oxalic acid, no turbidity occurs on standing in the cold, but the magnesium oxalate is nevertheless precipitated on boiling. For separating calcium from magnesium when both occur as carbonates, the author mixes the finely-powdered sample with ten parts of glycerine and a little water, and adds forty to fifty parts of a five-per-cent. solution of oxalic acid. Calcium and magnesium oxalates are both formed, the former remaining undissolved, whilst the magnesium salt passes into solution. After standing for half an hour, the calcium oxalate is collected upon a filter, washed, and determined as usual. The filtrate is boiled in a flask for five to eight minutes, filtered boiling, and the precipitate is dried and weighed as magnesia.

In a solution containing salts of calcium and magnesium, the liquid is first mixed with glycerin, a sufficiency of ammonium oxalate is added, the liquid is strongly acidulated with oxalic acid, and the process completed as above.

Magnesium can also be precipitated in presence of ferric oxide by adding glycerin, ammonium oxalate, and oxalic acid, and boiling. In order to determine the ferric oxide in the filtrate, it is heated to a boil along with ammonium carbonate, evaporated to dryness, and the glycerin extracted with alcohol. The insoluble residue is treated with ammoniacal water, and the ferric hydroxide is collected upon a filter.

For separating magnesia from the alkalies, the hydrochloric solution is boiled with ammonium oxálate and oxalic acid, and filtered at a boil.

The author gives the following method for ascertaining whether in calcined magnesia or in the carbonate the proportion of lime exceeds a certain limit:—0.1 gram of the calcined magnesia or 0.25 gram of the carbonate must be well shaken up in a test-tube with a solution of oxalic acid at five or ten per cent. Perfectly pure preparations dissolve in the first minute, and the solution remains clear for five minutes; in presence of lime the solution is turbid. In the latter case, the agitated turbid liquid is poured into a test-tube of 1.25 cm. in width, and an ink line upon paper 1 mm. in breadth is examined through the column of liquid. If this is still possible, the proportion of lime in the calcined magnesia does not exceed 0.25 per cent, and that in the carbonate 0.1 per cent.—New. Rem., June 1883, 171, from Zeitsch. f. Aanl. Chem. through Chem. News.

ALUMINIUM.

Aluminium—Improved Process of Manufacture.—Mr. James Webster, of Hollywood, England, has invented the following process for the production of aluminium: A given quantity of alum and pitch, which are first finely ground, are mixed together and placed in a calcining furnace, by which means 38 per cent. of water is driven out, leaving the sulphur, potash, and alumina with oxide of iron. The calcined mixture is then put into vertical retorts, and steam and air are forced through, which leaves a residue of potash and alumina only. This residue is afterwards placed in a vat filled with warm water, which is heated with steam. The potash is thus leached out, and the alumina left as a deposit. The potash liquor is then run off, boiled down, while the alumina precipitate is collected in sacks and dried. It is then ready for making chloride of aluminum. The alumina deposit thus obtained contains about 84 per cent. of pure alumina, while that which is obtained by the old process of precipitation has only 65 per cent. Mr. Jones, the Wolverhampton borough analyst, certifies that the constituents of Mr. Webster's alumina deposit are as follows: Alumina, 84.10; sulphate of zinc, 2.68; silica, 7.40; water, 4.20; alkaline salts, 1.62. In order to complete the process and convert it into aluminum, the chloride of aluminum is treated with sodium, in order to withdraw the metal. Aluminum is afterwards alloyed with copper, silver, and other metals. It is used for the manufacture of bismuth bronze, aluminum bronze, or any other alloys.—New Rem., Mar. 1883, 86, from Scient. American.

Sulphate of Aluminium—Preparation free from Iron.—C. Falberg, in conjunction with Semper, claims to have practically solved the problem of preparing sulphate of alluminium from bauxite ores so as to be free from iron, by the use of lead peroxide, which is prepared by first triturating a mixture of two parts lead monoxide and one part sodium chloride, until the mass assumes the white tint of lead oxychloride; the product is then boiled with bleaching powder until lead peroxide is formed, which is washed and preserved in the damp state. This paste is added to a neutral or slightly alkaline solution of bauxite in sulphuric acid; for every part of iron contained in the solution, twenty parts of the dioxide are required. It is necessary to work with concentrated solutions and to avoid a rise of temperature; the iron must also be as a ferric salt. In order to recover the peroxide employed, the solid matter is separated by a filter-press suspended in water, and then dilute sulphuric or nitric acid added, which leaves the peroxide undissolved, so that it can be employed a number of times without losing any of its properties.—New Rem., June 1883, 171, from Bul. Soc. Chim., through The Analyst.

Alums—Precipitation by Sodic Carbonate.—By a series of experiments, Edmund J. Wills and K. L. Barr find that the precipitation of an alum by sodic carbonate takes place in three stages. First, much carbonate is added without any precipitation taking place; secondly, there is a precipitation according to a continuous law until about half the alum is thrown down; and thirdly, the precipitation proceeds according to the previous law, but with altered constants.—Amer. Jour. Phar., Jan. 1883, 38, from Jour. Amer. Chem. Soc., Nov. 1882.

Ammonia Alum—Preparation.—Mr. W. Watson Will, refering to the difficulty now experienced by pharmacists in obtaining ammonia alum—the potassic salt having entirely taken its place—suggests the following mode of preparation, which is adaptable to small laboratories, with satisfactory results: Take of aluminum sulphate (cake alum) 14 lbs.; ammonium sulphate, 3½ lbs.; warm water, 4 gallons (Imp. meas.—REP.); dissolve the ammonium sulphate in half a gallon of water, and the aluminum sulphate in the remainder; filter to remove silica, and to the filtrate add the ammonia solution; then apply heat to boiling, and pour off into a suitable vessel to crystallize. The crystals are drained after a few days in a loosely stopped funnel. The salt corresponds to the requirements of the Br. Pharm.—Phar. Jour. Trans., July 8, 1882, 22.

Dried Alum—Solubility, etc.—The conflicting statements regarding the solubility of dried alum led Mr. E. Bailey to make a series of experiments which prove that when properly prepared according to the Ph. Br., at a temperature up to, and not exceeding, 400° F., the product is entirely soluble in cold water. Commercial specimens examined by the author were found on treatment with cold water to leave residues varying from ½ to 10 per cent.; such residues consisting chiefly of oxysulphate of aluminium powdered by overheating.—Phar. Jour. Trans., April 14, 1883, 838–839.

FERRUM.

Iron—Preparation of Normal Solutions.—Mr. B. Britton has examined a number of specimens of iron, such as are generally used for standardizing, and found them much more impure than is generally supposed. The average percentage of iron found in a number of pianoforte wires was 98.76. The purest sample of bar iron from Norway and Sweden contained, however, 99.6 per cent. iron. Iron salts were found to be still less trustworthy than metallic iron.—New Rem., May 1883, 132, from Chem. Centralbl., 1882, 733.

Iron Sesquioxide.—Action of ozone, which see under "Oxygen."

Ferric Hydrate.—Condition necessary for producing a stable solution of *Ferric Acetate*, which see under "Organic Chemistry."

Salts of Iron.—Action of *Glycerin*, which see under "Organic Chemistry."

Sulphate of Iron—Preservation.—A. Gawolovski introduces into the saline mass (of sulphate of iron precipitated by alcohol) or into the crystals, a thick-walled test-tube half filled with an alkaline solution of pyrogallic acid and glass-wool, in such a way that the top of the tube projects sufficiently over the level of the mass. If the vessel is well closed, the sulphate of iron will be perfectly preserved for two or three years, as the author has found by repeated experiments.—New Rem., Feb. 1883, 56, from Zeitschr. f. Anal. Chem., 1883, 33.

NICKEL.

Nickel—Separation from Cobalt.—G. Vortman describes a method for the detection of nickel and cobalt, which in many cases is more accurate and more readily executed than the methods of Fischer and Liebig. It consists in the varying behavior of an ammoniacal nickel and cobalt solution toward sodium hypochlorite. From the liquid which has been treated with this oxidizing agent, and diluted with water, potassium hydrate precipitates only the nickel as hydrate, whilst cobalt remains in solution.—Amer. Jour. Phar., May 1883, 262, from Chem. Ztg., No. 19, 1883, 282, and Ber. Akad. Wien., 1882, 270.

Sulphate of Nickel—Action of Sulphide of Hydrogen.—According to H. Bauligny, almost 90 per cent. of the nickel is thrown down as sulphide when sulphide of hydrogen is passed into a *neutral* solution of sulphate of nickel. The amount thrown down is independent of the concentration of the solution, and of the degree of saturation with sulphide of hydrogen, but depends on the duration of the experiment. The precipitation is also affected by the relative quantity of acid and metal, and the addition of an amount of sulphuric acid equal to one-fourth the quantity present in the salt prevents the formation of sulphide of nickel.—Jour. Chem. Soc., Aug. 1882, 805, from Compt. Rend., 94, 1183–1186.

Cobalt and Nickel Salts.—Action of Ozone, which see under "Oxygen."

CHROMIUM.

Bichromate of Potassium—Removal of Stains.—Those who work in chromic acid or bichromate of potassium are apt to acquire stains of the hand which are both disagreeable and persistent. The *Photographic News* gives the following directions for their removal: Rub the stains with a solution of sulphurous acid, and subsequently wash with distilled or soft water. Or, to a warm, strong solution of hyposulphite of soda add a small quantity of sulphuric acid; this may then be used on the stains with similar effect.—New Rem., March 1883, 77.

Chromic Salts.—Action of Ozone, which see under "Oxygen."

URANIUM.

Uranium.—Preparation of *Oleate*, which see under "Organic Chemistry."

ZINCUM.

Zinc Ores in Greece.—Professor Landerer states that until a few years ago the existence of calamine in Laurium was unknown; at present there are many mines, some of them 100 to 120 meters deep, yielding handsome ores occasionally associated with crystals of malachite or in stalactitic form. The ores are roasted, when a blackish-gray powder is obtained, which is exported to France and England, where it is converted into the metal. Zinc ores have also been discovered upon Tsesme in Asia Minor, opposite Chios, and upon the islands of Samos and Antiparos. Valuable ores, such as chrome-iron, argentiferous lead, and emery, have also been found in Thessaly, and a very handsomely crystallized nickel arsenate was discovered in Laurium.—Amer. Jour. Phar., 1883, 5.

Zinc—Boiling Point.—Mr. I. Violle, by means of an apparatus specially constructed to prevent cooling by radiation, etc , has determined the boiling point of pure zinc to be 930°, a number which agrees closely with that given by Becquerel, 932°, but differs considerably from that given by Deville and Trout, 1040°. Jour. Chem. Soc., July 1883, 697, from Compt. Rend., 94, 720–722.

Sulphate of Zinc—Purification.—H. Prunier purifies commercial sulphate of zinc, contaminated with iron, as follows: Dissolve 16 grams of the salt in 20 grams of water, acidulated with sulphuric acid, and add a sufficient quantity of solution of permanganate of potassium, until the liquid has a permanent rosy tint. The amount of solution of permanganate used being noted, any desired quantity of sulphate of zinc is dissolved in twice its weight of water, the calculated quantity of permanganate added, and the mixture boiled after the addition of a small quantity of water of ammonia diluted with 10 parts of water, more of the latter being added if after boiling a few minutes the liquid is not quite colorless. The liquid is allowed to cool, filtered, evaporated to 155 parts per 100 parts of commercial salt used, and set aside to crystallize.—New Rem., Sep. 1882, 271, from Jour. de Phar. et de Chim.

PLUMBUM.

Chloride of Lead.—A new reagent for *Alkaloids*, which see under "Organic Chemistry."

Lead Salts—Decomposition by Alkalies.—Mr. A. Ditte has observed that if chloride of lead is suspended in water, and solution of hydrate of potassium is added little by little with continual agitation, the alkalinity disappears up to a certain point, at which the chloride of lead is converted into a curdy mass of white transparent needles of the composition $PbCl_2.\ 2PbO$. When this compound is suspended in water, and hydrate of potassium added, it undergoes but little decomposition until the degree of concentration of the alkaline solution reaches a certain point, when the oxychloride is rapidly converted into grey anhydrous oxide. If hydrated oxide of lead is treated with chloride of potassium at ordinary temperatures, the liquid becomes alkaline, oxychloride of lead and hydrate of potassium being formed. This change goes on until the quantity of alkali present reaches a certain limit, when two changes become possible: the decomposition of the oxychloride of lead, with production of chloride of potassium and oxide of lead, and the conversion of the oxide into oxychloride, with the formation of hydrate of potassium. A condition of equilibrium is established between the chloride and hydrate of potassium and the oxychloride and oxide of lead, the relative proportions of the different substances varying with the temperature. The bromide and the iodide of lead behave in a similar manner with alkalies. Jour. Chem. Soc., Aug. 1882, 805, from Compt. Rend., 94, 1181–1182.

Lead Salts.—Action of Ozone, which see under "Oxygen."

CUPRUM.

Copper—New Method of Purification.—Mr. J. Garnier has made successful experiments with the purpose of removing arsenic and antimony from commercial copper. Mr. Garnier employs a sole of chalk and tar, over which, for each separate operation, he places a false sole of limestone and peroxide of manganese. With the melting of the copper a generation of carbonic acid and oxygen begins from the upper sole, which oxidizes the charge. As soon as the metal is sufficiently liquid, the lime and peroxide of manganese rise and dissolve the arsenic acid, the amount of arsenic in the metal being thus reduced to one-fifth. By subsequent fusions with basic fluxes the arsenic is almost completely eliminated. Special advantages claimed by Mr. Garnier for his process are: That the roasting of the black copper becomes unnecessary, and that the loss of copper, arising from parts of the copper combining with the silica of the slag, is avoided.—New Rem., Aug. 1882, 245, from Compt. Rend.

Copper.—Compound with *Albumen*, which see under "Organic Chemistry."

Anhydrous Sulphate of Copper—Behavior Toward Absolute Methyl Alcohol.—A. Klepl has made the observation that anhydrous sulphate of copper is somewhat soluble in absolute methyl-alcohol, but that the subsequent addition of about one-tenth its volume of water, and of a further small amount of the anhydrous salt, and shaking, cause the complete separation of the copper salt, and a restoration of the methyl-alcohol from a bluish-green tint to a colorless condition. Absolute methyl-alcohol, therefore, can dissolve a small quantity of anhydrous sulphate of copper. But the latter is so eager to take up water that it will abstract it from hydrous alcohol. The crystalline salt is entirely insoluble in the menstruum. Anhydrous sulphate of copper may, hence, be used as a test to ascertain the absence of more than a trace of water in methyl-alcohol.—New Rem., Oct. 1882, 296, from Jour. f. prakt. Chem., 1882, 526.

Processes for Direct Coppering of Castings of Iron and Steel.—F. Weil gives an account of the processes devised by him for the direct coppering of castings of iron and steel, without the use of any intermediate coating of plumbago or other material upon the surface of the casting.

The deposit of copper by this method is so homogeneous, and so faithfully reproduces the most delicate details of ornamentation, as to give to articles so coppered the artistic value of bronze; and at the same time is so firmly adherent that castings coppered by this process have remained exposed to the weather for ten years without requiring any retouching. The alkaline organic baths used in the process present several advantages over the ordinary alkaline baths used in electrotyping. The cyanides, which are both injurious to the health of the workmen and expensive, are replaced by organic acids, or by glycerin, both of which are cheap, and have the advantage of not being decomposed in the operation. Thus the baths require no renewal of organic material, and act continuously, provided the necessary amount of oxide of copper is added from time to time. Finally the well-known property of alkaline organic solutions, of dissolving oxide of iron easily and rapidly, without attacking the metal itself, always renders the cleansing of the castings perfect, as the bath finishes the cleansing of articles before coppering them.

The process is carried on in three different ways, according to local conditions and the different applications of the articles to be coppered. The first method consists in plunging the articles in the bath in contact with strips of zinc. The coppering begins immediately, and according to the alkalinity of the bath and the destination of the articles to be coppered, requires a variable time, from a few minutes to several hours.

The second process, which has been employed with great success for coppering the street lamps of a large city, consists in placing in the vessel containing the bath and the objects to be plated porous jars, filled with a strong solution of caustic soda, in which are placed plates of zinc, connected with the articles in the bath by a coarse copper wire. The time required for depositing a moderately thick coating of copper, such as required by candelabra, etc., is very short.

The third process consists in the use of the same baths as in the first and second processes, in conjunction with a dynamo-electrical machine.

The baths, as has been said, only require the addition of a certain amount of oxide of copper from time to time, and by a simple method of titration, also devised by Mr. Weil, the exact amount of copper oxide to be added can be readily and quickly determined.

These processes can be also applied to the deposition of all metals, such as nickel, cobalt, antimony, tin, etc., upon castings of iron and other metals.—Am. Jour. Phar., Aug. 1882, 396, from Comptes Rendus, 93, 1018.

VANADIUM.

Vanadium—Presence in the Slag of Puddling Furnaces.—Mr. Edo Claassen draws attention to the presence of vanadium in the slag of puddling furnaces. From the slag taken from the puddling furnaces, in which pig iron, made from Lake Superior hematite, was treated with magnetite from Lake Champlain, Mr. Claassen obtained small quantities of vanadic acid amounting to 4 grains from 5 pounds of slag.—New Rem., Nov. 1882, 322.

BISMUTHUM.

Bismuth.—Use in the form of tartrate for hair dye, which see under "Pharmacy."

Bismuthic Oxide.—Action of Ozone, which see under "Oxygen."

Iodides of Bismuth—Composition of a New Iodide.—Messrs. F. W. Fletcher and H. P. Cooper have subjected the iodides of bismuth to critical examination, and record their experiments and results. The iodides of bismuth described in text books are two, viz., a black tri-iodide ($Bi\,I_3$) and a red oxy-iodide ($Bi\,OI$). The authors have observed and described a new compound, which from its color they designate as

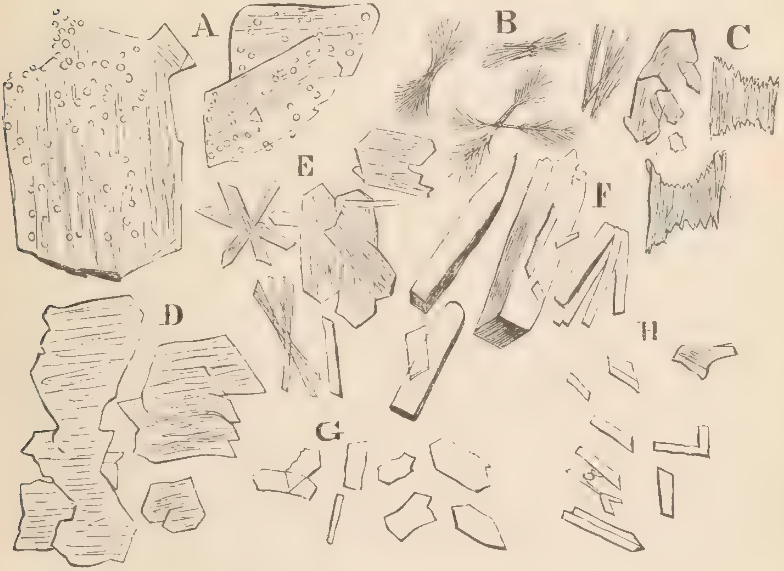
Yellow Iodide of Bismuth.—They find that this compound can be readily prepared by pouring a very dilute solution of nitrate of bismuth into mixed solutions of iodide of potassium and acetate of sodium. It is sparingly soluble in acetic, and freely in hydrochloric acid. Sulphuric and nitric acids liberate iodine. Digested with zinc and dilute sulphuric acid, the bismuth is deposited as metal, and the iodine passes into solution as iodide of zinc. It is not decomposed by water, even at a boiling temperature. Obtained as above, it has a fine yellow color, and appears to be uniformly a very basic compound, having the composition $Bi\,I_3$, $5Bi_2O_3$; but obtained by different methods it varies in color, the quantity of iodine being in proportion to the density of color. The formula of the tri-iodide of bismuth being $Bi\,I_3$ and that of the oxy-iodide or bismuthyl iodide $Bi\,OI$, the latter may be regarded as formed from 1 molecule of $Bi\,I_3$ and 1 molecule Bi_2O_3, thus: $Bi\,I_3 + Bi_2O_3 = 3\,Bi\,OI$. Year-book or Pharm., 1882, 472–479.

Potassio-bismuthic Iodide—Preparation for Alkaloid-reactions.—F.

Maugni has observed that the above-named reagent, as recommended by Dragendorff on account of its sensitiveness, and which he had prepared according to the Russian method, gave also with pure water a turbidity. It was then prepared by the author, by the admixture of 3 parts of potassium iodide, 16 parts bismuth iodide, and 3 parts of hydrochloric acid. When prepared in this way it gave no turbidity with water, was very sensitive, and permitted even, what has been refuted by Dragendorff, the discrimination of the individual alkaloids by means of the color and behavior of the precipitate.—Amer. Jour. Phar., July 1882, 358, through Chem. Ztg., No. 25, 1882, p. 494, from Gazz. Chim., 12, p. 155.

Bismuth Subnitrate—Influences that Modify its Physical Condition, etc.—Mr. Simon E. Wolf having learned that in a post-mortem examination bismuth subnitrate had been found in the stomach in an unchanged state, except that the particles had become covered with a thin coating of bismuth sulphide, several commercial samples of the subnitrate were examined microscopically and found to be, some of them distinctly crystalline, others amorphous. This induced an inquiry into the conditions under which bismuth subnitrate may be obtained in different forms; the results show that the precipitation of the salt is influenced by the temperature, the amount of the precipitating liquid, the manner in which the latter is added, and by its composition. It appears that analogous salts, especially the nitrates, interfere with the precipitation of the subnitrate, and en-

FIG. 38.



Bismuth Subnitrate Magnified.

able solutions of bismuth nitrate to be diluted with much larger volumes of water than when these salts are absent. For all the experiments the same solution was used, prepared by dissolving 30 gm. of bismuth subnitrate in 30 cc. of nitric acid with the aid of heat, and adding sufficient distilled water to make the solution measure 150 cubic centimeters.

The appearance of the subnitrate obtained under different conditions is shown in the accompanying cut (Fig 42), the conditions being as follows: A, from little cold water; B, in presence of KNO_3; C, in presence of $Hg_2(NO_3)_2$; D, in presence of $Ni(NO_3)_2$; E, in presence of $Pb(NO_3)_2$; F, from much cold water; G, H, commercial samples, elutriated.

The author also made some quantitative experiments as follows: 10 cc. of the solution were precipitated, first with 50 cc. cold water; secondly with 50 cc. boiling water, and thirdly with 500 cc. cold water; the precipitates were dried in an air-bath, weighed, then ignited and again weighed. A sample of bismuth subnitrate IV, prepared strictly in accordance with the Pharmacopœia of 1870, was examined in like manner. The results were as follows:

	I.	II.	III.	IV.
Weight of precipitate	1.0 gm.	1.05 gm.	.396 gm.	1.0 gm.
Weight of oxide	.753 gm.	.855 gm.	.329 gm.	.865 gm.
Percentage of oxide	75.3	81.4	83.3	86.5

The formula $BiONO_3$ indicates 81.2 per cent. Bi_2O_3, and the formula $BiONO_3H_2O = 76.47$ per cent. of oxide, obtainable by ignition.—Am. Jour. Phar., Dec. 1882, 593–595.

ARSENICUM.

Arsenic—Reactions.—W. A. H. Naylor and J. O. Braithwaite have contributed an interesting paper on some reactions of arsenic. Referring to the observation of Patrouillard (Répert. de Pharm. iii., 582), that arsenic compounds may be reduced equally as well with oxalic acid as with sulphurous acid, and that oxalic acid has the further advantage of being always at hand, the authors give an account of a series of experiments, made according to the original instructions of Patrouillard, which seem to show the inefficiency of oxalic acid as a reducing agent; and they express the opinion that oxalic acid exerts no reducing action under the conditions described by Patrouillard. The authors also give an account of their method of employing the copper test for arsenious acid in the presence of arsenic acid. They use for this purpose a modified Fehling's solution prepared as follows:

Cupric sulphate recrystallized	.200 gram
Water to measure	50 cc.

Dissolve.

Tartarated soda, crystallized	.50 grams
Caustic soda	5.00 grams
Water to measure	50 cc.

Dissolve.

The two solutions are kept separate, and mixed as required for use. In the presence of arsenious acid a corresponding proportion of this test solution suffers reduction on boiling, and it is possible to thus detect 1 milligram in admixture with 2 decigrams of arsenic acid. The delicacy of the test is, however, materially impaired by the presence of certain organic acids, as oxalic, citric, acetic, and tartaric. Sulphates and nitrates do not interfere, nor do chlorides, unless present in quantities proportionately large.

The authors, furthermore, have developed a very delicate volumetric test for the estimation of arsenious in the presence of arsenic acid, which is based upon the oxidation of the former in the presence of mercuric salts. When mercuric chloride is added to a solution of arsenious acid only moderately alkaline, the solution remains clear, and on standing becomes opalescent to a degree dependent on the amount of arsenic present. If, however, the solution is rendered strongly alkaline with caustic soda or potash, and then a weak solution of mercuric chloride be added, the mercuric oxide at first deposited quickly disappears, leaving as before a clear solution, which rapidly becomes cloudy, and if set aside deposits a greyish deposit of metallic mercury. If, in addition, the solution be boiling, the liquid will assume a dark color the instant the mercuric chloride is added. In the presence of arsenic acid alone, the mercuric oxide produced by the first drop of mercuric chloride will color the solution permanently yellow. From a knowledge of these facts, the authors have successfully devised their volumetric tests, the reaction taking place between 1 molecule of arsenic trioxide and 2 molecules of mercuric chloride. Standard solutions of mercuric chloride and alkaline arsenite were prepared of strength corresponding respectively to 13.55 grams of mercuric chloride and 4.95 grams of arsenic trioxide per litre. The mode of application consisted in delivering the mercuric solution from a burette into a measured volume of the arsenic solution previously heated to the boiling point, and rendered strongly alkaline with caustic soda. When the mercuric oxide ceased to disappear and from its presence imparted a permanently yellow tint to the liquid, the reading of the burette was taken. The authors give the result of a series of experiments in which from .051 to .097 grams of As_2O_3 were taken, the results indicating the correct quantity within .001 gram more or less. Equally good results may be obtained in presence of much chloride, sulphate, carbonate, or bicarbonate, but phosphate prohibits its use. Yearbook of Pharm., 1882, 438–445.

Referring to that portion of the above paper in which his method of reduction by means of oxalic acid is placed in question, Mr. C. Patrouillard maintains the correctness of his former observations, and cites experiments since made in support of his assertion. He agrees with Messrs. Naylor and Braithwaite that oxalic acid does not exercise any reducing action upon free arsenic acid; but he maintains that when that acid is combined with an alkali it is reduced by oxalic acid to arsenious acid, and that the reduction is more complete in proportion to the perfectness of the neutrality of the medium in which it is effected. Moreover, these are the conditions previously described by him, since arsenious acid could hardly be found mixed with other salts except in that state. When a salt contains at least 1 to 2 per cent. of an arseniate, the reduction will take place at an interval more or less long; with 5 or 10 per cent. the reaction occurs immediately. The author observes also that he has repeated the reaction many times since he first wrote in 1874, and has uniformly succeeded in reducing arsenic acid by means of oxalic acid.—Phar. Jour. Trans., Nov. 4, 1882, 362–363.

In reply to Mr. Patrouillard, Messrs. Naylor and Braithwaite communicate some further experiments, which lead them to the conclusion that oxalic acid *alone* exercises no reducing action, either on arsenic acid or on disodic arseniate. Further, that the oxalic acid cannot be credited *indirectly* with the reduction which results from the transmission of sulphuretted hydrogen through the solution of arseniate and oxalate previously boiled and acidified with sulphuric acid.—Ibid, Dec. 9, 1882, 464–465.

Terbromide of Arsenic—Preparation.—Mr. R. F. Fairthorne communicates the following method pursued by him in the preparation of this compound:

Take of

Metallic arsenic	77 grains.
Bromine	240 grains.

Having placed the bromine in the bottom of a long test-tube immersed in ice water, add the arsenic in powder in small portions at a time, agitating gently after each addition, and allowing the mixture to become cool before adding more of the metal; after the whole has been put into the tube, close this with a cork, remove from the water, and occasionally agitate during six hours; then pour into a suitable glass-stoppered vial. Terbromide of arsenic is a dense, orange-colored liquid, slightly volatile at ordinary temperatures, but entirely so by application of heat with the production of yellow pungent fumes.

In preparing the terbromide great caution is necessary, as the action of bromine on arsenic is very violent, and unless great care is taken, so much heat is produced upon the addition of the metal that it becomes red-hot, and copious fumes of the bromide of arsenic are given off, which of course are very poisonous. The author also gives a formula for *Solution of Terbromide of Arsenic*, which see under "Pharmacy."—Amer. Jour. Phar., March 1883, 143.

Referring to the above, Mr. Frank L. Slocum reviews the character of arsenic terbromide, and concludes that Mr. Fairthorne's preparation is simply a weak hydrobromic acid solution of arsenious anhydride, an aqueous solution of $AsBr_3$ being an impossibility. The odor of the solution is probably due to impurities in the bromine used, owing to the powerful oxidizing action of the tribromide. Mr. Slocum doubts its utility as a medicinal agent. If there is any medicinal virtue in the haloid compound of arsenic, he believes it must lie in the oxy-compounds $AsOBr$ or $AsOI$, both of which are easily prepared.—Amer. Jour. Phar., May 1883, 225–227.

ANTIMONIUM.

Sulphantimoniate of Sodium.—A new reagent for *alkaloids*, which see under "Organic Chemistry."

HYDRARGYRUM.

Mercuric Chloride—Use for the Volumetric Determination of Arsenious Acid.—See *Arsenic Acid* under "Inorganic Chemistry."

Protoiodide of Mercury—Preparation by Double Decomposition.—Mr. Henry Maclagan regards the officinal process for the preparation of this compound to be objectionable, particularly because of the invariable formation of red iodide, and the difficulty of removing the latter. He recommends its preparation by double decomposition between a protosalt of mercury and iodide of potassium, and uses for this purpose the protonitrate, which, by proper attention to details, can be readily obtained free from pernitrate. The protonitrate yields a pure protoiodide of double decomposition with iodide of potassium, and only needs washing with pure water. In washing the protonitrate, a considerable excess of mercury should be used, with acid of the strength of 8 parts (by measure) of HNO_3, sp. gr. 1.42, and 5 parts of water, the whole kept cool by ice, and constantly stirred until red fumes cease to be given off, then sufficient water added to complete the solution. The iodide of potassium solution should be very dilute, and added slowly with constant agitation, and the precipitate marked by decantation. A pure protoiodide is thus obtained in form of an impalpable powder. It has a beautiful yellow color, with scarcely a tinge of green. He regards yellow to be the true color, and therefore considers that the title "Viride" should be discarded as misleading, and "Flavum" substituted. Drug. Circ., March 1883, 33.

Mercuric Nitrate.—A precipitant for *Asparagin*, which see under "Organic Chemistry."

Mercurous Salts.—Action of Ozone, which see under "Oxygen."

ARGENTUM.

Silver—Production from the Slags of Ancient Lead Works in Greece.—Professor X. Landerer states that *argentiferous galena* was worked near Laurium by Pericles 2,300 years ago in an *ergasterion*, workshop, and the silver obtained by a kind of cupellation; the precious metal furnished the means for erecting the grand architectural and sculptural works, the remnants of which are admired to the present day. The slags accumulated from the smelting works received no attention until 1863. Prof. Landerer had found in such slags 8 per cent. of lead containing silver, and it was ascertained that the amount varied between 4 and 14 per cent. These slags were purchased by Sicilian speculators at a very low price, and have been smelted since 1865, large quantities of argentiferous lead having been obtained, containing to the ton often from 500 to 1,200 grams of silver, which is prepared from it in France and England. More recently the mines and the *ekbolades*, or argentiferous refuse, are worked by a Greek stock company, the ore being first washed to separate the earthy matter, then formed into bricks and smelted with charcoal. By gambling in these shares many families have been reduced to poverty.—Amer. Jour. Phar., Jan. 1883, 5.

Silver Salts.—Action of Ozone, which see under "Oxygen."

Silver Salts—Purity of Commercial Samples in England.—Mr. John Woodland has examined commercial salts of silver, giving his methods, and the following results:

CAUSTIC POINTS.

No. of Sample.	*Percentage of $AgNO_3$.*	*Name of Diluent.*	*Percentage of Diluent.*
1	63	Potassium Nitrate.	36
2	71	Sodium Nitrate.	26
3	64	Potassium Nitrate.	35
4	75	Potassium Nitrate.	25

CRYSTALS OF NITRATE OF SILVER.

No. of Sample.	*Percentage of $AgNO_3$.*	*Name of Diluent.*	*Percentage of Diluent.*
1	89	Potassium Nitrate.	10
2	99	None.	
3	92	Potassium Nitrate.	8
4	84	Sodium Nitrate.	14
5	80	Potassium Nitrate.	19
6	100	None.	

OXIDE OF SILVER.

No.	*Percentage of Silver.*	*Corresponding Percentage of Oxide.*	*Impurities.*	*Percentage of Impurities.*
1	76	81	Carbonate and Chloride of Silver.	19
2	70	75	Silicious Matter.	25
3	81	87	Carbonate and Chloride of Silver.	13
4	72	77	" " "	24
5	78	83	" " "	17
6	69	74	" " "	26

Most of the samples of oxide had been in stock for some time. Yearbook of Pharm., 1882, 517–518.

Hyponitrite of Silver—Preparation.—See *Hyponitrous Acid,* under "Nitrogen."

AURUM.

Chloride of Gold—Commercial Quality.—Mr. F. W. Branson has examined chloride of gold from four different manufacturers, designated respectively *A*, *B*, *C*, and *D*. Four 15-grain tubes bearing the label of *A* contained an average of 14.957 grains of chloride, and yielded an average of 7.286 of metallic gold; two tubes of *B*, 15.146 chloride and 7.215 of metal; two tubes of *C*. 15.058 of chloride and 7.317 of metal; and four tubes of *D*, 13.749 of chloride and 6.654 of metal. The best precipitant for the metal was found to be pure oxalic acid. The precipitation proceeds rather slower than with either sulphurous acid or ferrous sulphate; but the metal is thrown out of solution in more coherent form, and in the presence of platinum or other metals, these are less likely to be carried down with the gold. Metals precipitated by H_2S or Am HS were practically absent from all the above samples.—Yearbook of Phar., 1882, 472–474.

NEW METALS.

β. Didymium—Supposed New Element.—P. T. Clève publishes a note on didymium and a supposed new element which accompanies it. In purifying didymium preparations, he got fractions showing a variation in spectral lines, and giving for the atomic weight of didymium values varying from 146 to 142. The first of these he considers as pure didymium, and the last to be contaminated with an element yet to be isolated, which he designates provisionally as Diβ.—Amer. Jour. Phar., Aug. 1882, 395, from Chem. News, June 23, p. 273.

Philippium—Non-existence.—Roscoe has recently made a study of the mixture of rare earths from samarskite, with a view of determining whether De la Fontaine's philippium has any real existence or not. De la Fontaine had given, as one characteristic of the supposed element the fact that it formed a well-crystallized formiate distinct from that of terbium or yttrium. Roscoe finds that a mixture of the formiates of terbium and yttrium can crystallize in the single forms described as characteristic of philippium. He comes to the same conclusion with regard to the non-existence of philippium from a spectroscopic view of the several oxides, and from the standpoint of Mendelejeff's periodic system of the elements shows that an element is not to be expected in the position of philippium and with the properties ascribed to it.—Amer. Jour. Phar., Aug. 1882, 395, from Ber. Chem. Ges., xv., p. 1274.

ORGANIC CHEMISTRY.

HYDROCARBONS.

(*Including Volatile Oils and Resins.*)

Mineral Oils—Estimation in Fats and Resins.—A. Gawalowski proceeds as follows: Twenty grams of the fat or resin are saponified in a large porcelain capsule with a solution of fifteen to twenty grams of caustic potassa in 100 to 150 cubic centimeters of water, and the soapy mixture finally evaporated at a gentle heat to dryness. The soap residue is then dissolved in luke warm water, the solution brought into a separating funnel, and, after cooling, shaken with ten to fifteen cubic centimeters of petroleum ether. After standing for six or eight hours the clear lower liquid is decanted, the petroleum ether layer is repeatedly washed with lukewarm water until a portion of the separated wash water no longer froths upon agitation, and the combined soap lyes decomposed with dilute sulphuric acid. The fatty acids which are thereby liberated are extracted with ether, and freed from the latter by evaporation. The original petroleum ether layer is allowed to evaporate at a gentle heat, dried over sulphuric acid or in an air-bath, and the residual mineral oil weighed.

Comparative experiments with known mixtures of mineral oils with saponifiable fats, afforded perfectly satisfactory results. Amer. Jour. Phar., May 1883, 264, from Chem. Ztg. No. 26, 1883.

Petroleum Benzin—Purification.—The disagreeable odor of petroleum benzin is, according to the experiments of Fred. Grazer, not removed by percolation through wood or animal charcoal, or by treatment with carbonate of sodium or lead carbonate. Agitation with potassium plumbate removed a portion of the odor, but satisfactory results were obtained by using two ounces of potassium bichromate, 12 ounces of water and 3 ounces of sulphuric acid, and when cool agitating with this a pint of benzin; finally, washing with water is necessary. A very useful method for disguising the remaining odor is to shake the product with a portion of cologne water and setting aside for two or three weeks, when it may be decanted; the odor of the perfume will predominate.—Amer. Jour. Phar., May 1883, 252, from Proc. Cal. Phar. Soc., 1883, 45–46.

Deodorized Benzin—Preparation.—Mr. C. S. Hallberg recommends the use of deodorized petroleum benzin for the purification of ergot (which see under Materia Medica), the process of deodorization being as follows: To commercial petroleum benzin, of sp. gr. 0.716, add gradually with agitation about 3 per cent. of sulphuric acid diluted with an equal quantity of water; after standing decant from the black tarry residue. Wash the benzin with water to which has been added sufficient carbonate of soda to neutralize the acid, decant and then wash repeatedly the benzin, lastly separate carefully from the water or distil. This yields a product possessing very little taste or odor, and will be found very useful in the laboratory and for domestic use.—Amer. Jour. Phar., Jan. 1883, 9.

Liquid and Solid Paraffin—Inaccuracy of the German Pharmacopœia Test.—The new German Pharmacopœia requires, among other things, that the "Liquid Paraffin," also called "white vaseline oil," which forms a constituent of the paraffin-ointment, when digested on the water-bath during one day, under repeated agitation with "sulphuric acid," shall not be altered, and should not impart more than a faint brown color to the acid. Now, as there is no special spec. grav. mentioned, the "sulphuric acid" of the text can only mean the officinal acid, which has the spec. grav. 1.836 to 1.840. But it has been ascertained that even the purest and best kinds of the commercial vaseline oils (spindle oils) do not stand this test. Prof. R. Fresenius, of Wiesbaden, whose attention has been drawn to this by a communication of Mr. Ulmann, apothecary at Fulda, in the Pharm. Zeit., examined many kinds of the oil, and found none which would pass muster. Evidently the Pharmacopœia Commission erred, either in not selecting sulphuric acid of a lower specific gravity, as was done in the United States Pharmacopœia, or they failed to experiment properly before writing down the requirements.

Prof. Fresenius states that the test may be used, employing the strong acid if the time of digestion on the water-bath be reduced from one day (=12 hours) to thirty to forty minutes. Good oils remain colorless themselves, but impart to the acid a light-brownish or brownish tint; impure oils turn yellowish-brown, and color the acid brownish-black.

According to Prof. Fresenius, the same fault must be found with the test for "solid paraffin," as he has not yet found a sample of the latter which would stand the test with sulphuric acid. New Rem., Mar. 1883, 83, from Pharmac. Centralh., 1882, No. 15.

Asphalts—Distribution.—The following interesting account of the distribution of asphalts, taken from E. J. Hallock's "American and Foreign

Asphalts," may properly find place here: Bituminous substances, apparently of organic origin, are found in various parts of the world. Sometimes they occur in a free state, as in the Island of Trinidad, and at others impregnating calcareous rocks, or serving as a cement to hold the particles together, as at Val de Travers or Seyssel.

For several reasons the asphalt lake in Trinidad possesses special interest for us. The island, which is the southernmost of the Lesser Antilles, lies off the northern coast of South America, and is easily accessible from any of our sea ports. Here, amid the most luxuriant vegetation, is a lake three miles in circumference, on the surface of which lies a crust of asphaltum of such tenacity that in the rainy reason a person can walk across it; but, under the influence of the hot sun it softens to a thick tar. This crust receives accessions from beneath, and formerly it would overflow and run into the sea, more than two miles away. A similar substance, known as "Jew's pitch," is washed ashore in considerable quantities around the borders of the Dead Sea. In Texas, south of Shreveport, there is said to be a pitch lake containing large quantities of bitumen, but little is yet known about it. In Southern California there are accumulations of asphalt on the coast at Santa Barbara, San Luis Obispo, etc., which resembles, when pure, that from Trinidad. It promises to supply the wants of the western coast, as Trinidad will that of the eastern part of this country.

In Kentucky there is a considerable quantity of asphaltic mineral which may some time be utilized for road-making.

An interesting and valuable asphaltic mineral, known as Albertite, is found in New Brunswick; and a similar one, called Grahamite, occurs in West Virginia and other parts of the country. In the mountains west of Denver, in Colorado, is a vertical bed of hard and brittle asphalt, not unlike Grahamite, while Albertite is found in small quantities in Lorain county, Ohio, and Casey county, Kentucky.

Bitumen is likewise found in Cuba, and is brought into commerce under the name of *chapopote*, or Mexican asphalt.

In Europe asphalt occurs chiefly in limestone, which forms, when crushed and packed, an excellent pavement. The principal points at which it is found are the following: Val de Travers, in the Swiss Canton of Neufchâtel, fourteen miles from Neufchâtel, and sixteen or seventeen miles by rail from the French borders; Seyssel, on the Rhône, in the French department of the Ain, about thirty-three miles from Geneva; Lobsann, a small town in northern Alsace; Vorwohle in Braunschweig; and Limmer, near the city of Hanover. The Italian province of Caserta, in the neighborhood of Naples, supplies Rome with an asphalt much used for terraces and flat roofs.—Amer. Jour. Phar. March 1883, 155, from Popular Sci. Monthly, Dec. 1882.

Naphthol—Purification for Ointments.—Commercial naphthol when used in ointments undergoes a decomposition, a brown oil being separated. To avoid this, Causse proposes the purification of naphthol, which is powdered and for several hours treated with chloroform, in which liquid it is insoluble; the chloroform solution is afterwards decanted or filtered, and the naphthol fused until the odor of chloroform has disappeared. Amer. Jour. Phar., May 1883, 271, from Jour. Phar. Chim., Feb. 1883, 143.

Naphthalin—Antiseptic Value.—According to an article in Amer. Jour. Med. Sci. naphthalin is available for all the purposes to which iodoform has been applied, and as yet no constitutional effects have been observed to follow its use locally. It is as powerful an antiseptic and "antibacteric" as iodoform, and has a less disagreeable [?] smell. Its application causes a slight transitory sensation of heat, but no pain. Anschütz states that very sensitive granulations sometimes bleed rather freely after it has been applied, owing to the sharp angles of the hard crystals. This can be obviated by using it in fine powder, though if there is much discharge it is then apt to form a crust on the surface of the granulations. When the crystalline form is used the discharges escape freely. Amer. Jour. Phar., April 1883, 200, from Med. and Surg. Reporter.

Toluene—Process for the Production of Benzoic Acid and Bitter Almond Oil from its Chloro-derivatives.—A. T. Job communicates some interesting notes on the production of benzoic acid and benzaldehyde (bitter almond oil) from toluene ($C_6H_5CH_3$). The first step is the formation of the required chlorotoluene. For this purpose a Bohemian flask of a capacity of about half a litre, and having a short wide neck, is fitted with a thermometer ranging above 215° C, a glass distillatory tube connected with a Liebig's condenser, and a straight tube for the introduction of dry chlorine gas, which tube when fitted with a thistle funnel also serves as a means of replacing the distillates back into the flask without in any way disturbing the cork or luting. The toluene (obtained by successively redistilling commercial toluene, and collecting the portion passing over at 111° C) is placed into the flask and heated over a shallow sand-bath; when it boils the chlorine (dried by sulphuric acid) is passed through in a continuous stream. When the thermometer indicates a constant temperature of 176° C, the distillate will be found to consist of *monochloromethyl benzene*, $C_6H_5CH_2Cl$; upon continuing the chlorination, the next body formed is the *dichloromethyl benzene*, $C_6H_5CHCl_2$, a colorless liquid with a faint odor, boiling point 206° C. By carrying on chlorination until no increase in weight on the part of the liquid in the flask takes place *trichloromethyl benzene*, $C_6H_5CCl_3$, a colorless liquid, boiling at 215°–216° C, is formed. The formation of the latter is somewhat troublesome and tedious, a small quantity taking several days to chlorinate. The dichloromethyl benzene yields *benzaldehyde* while the trichloromethyl benzene yields *benzoic acid*. The author describes different methods for their conversion. Jacobsen, under his patent, employs glacial acetic acid and chloride or oxide of zinc for this purpose. When these are employed in molecular proportions, the author found, in the case dichloromethyl benzene, that an acetyl derivative of benzaldehyde is formed, but that when a little water is added at intervals, after heating the ingredients for a short time, benzaldehyde distils over with acetic acid. From the distillates the benzaldehyde may be separated by neutralizing with sodium carbonate, and redistilling; or separating the benzaldehyde by decantation and washing with water until pure. For the preparation of benzoic acid from the trichloro compound a similar method is employed. Phar. Jour. Trans., July 22, 1882, 61–62.

Terpin Hydrate—Preparation and Crystallography.—Mr. R. H. Parker having identified some crystals formed in a bottle of furniture polish (presumably a preparation of linseed oil, terpentine, butter of antimony, and methylated spirits) to be terpin hydrate, was led to study the conditions of the formation of that compound, as well as its character in general. He found the following process to produce terpin hydrate most successfully. Mix one volume of nitric acid, sp. gr. 1.25, with one volume of methylated spirit, cool, place the mixture in a shallow glass dish, and float upon it two volumes of oil of turpentine, rotate the vessel occasionally, and in three or four days crystals appear. Allow to remain undisturbed for about fourteen days, collect the crystals on muslin, wash with cold water, drain and dry by exposure to air, re-crystallize, if necessary, from slightly diluted alcohol. Most of the terpin hydrate is deposited during the period above named. The acid layer may be made to convert fresh portions of oil of turpentine into terpin hydrate. The total produce does not often exceed one-third of the weight of oil ol turpentine taken.

The crystals which are first produced in the preparation of this substance are often extremely well formed, and if simply wiped, avoiding washing with water, the faces are remarkably brilliant. This consequently affords an excellent opportunity for the study of the crystalline form, which is a combination of the rhombic octahedron and prism, in which the faces of the former are dominant; those of the latter are often much reduced, but never disappear. Fig. 39 illustrates the average form,

Fig. 39.

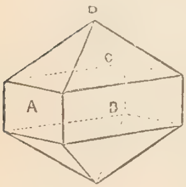


Fig. 40.

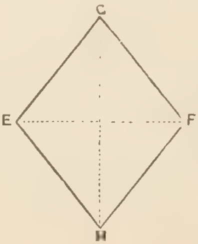


Fig. 41.

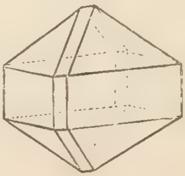
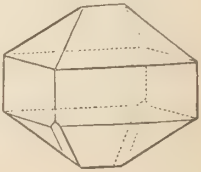


Fig. 42.



Terpin Hydrate.

which, however, is not often completely developed. Fig. 40 illustrates the horizontal section. Occasionally the macrodiagonal edge (*G* and *H*, Fig 40), is replaced by a narrow face, which is shown in Fig. 41, carried round the complete crystal. But the most important modification of form to which the crystal is subject consists in decrements from one or more faces of the prism and pyramid; in fact, nearly all are more or less modified in this way, the prism becoming more or less flattened, and the solid angle at the apex being reduced to a horizontal edge, forming a dome instead of a pyramid. Fig. 42, which illustrates these changes, and also the appearances of the macrodiagonal face on the lower side, may be taken as the typical form of terpin hydrate crystals. When produced from alcoholic solution, even slowly, the tendency is to form elongated prisms and needles, but the terminal pyramid is always evident. The brachydiagonal edge (*E* and *F*, Fig. 2), does not appear in any case replaced by a face. The author also records the measurements of the different angles of the crystals.

The specific gravity of terpin hydrate was found on the average to be 1.09, relative to distilled water at 17.5° C., and varies slightly. At 20° C. it requires 13 parts of alcohol, sp. gr. .825, for solution, and about 350 parts of distilled water; its solubility in alcohol is much increased by heat, and boiling water dissolves about 3 per cent. It is slightly soluble in chloroform, carbon bisulphide, ether, and benzole; scarcely in turpentine.—Yearbook of Pharm., 1882, 416-422.

Volatile Oils—Method of Distinguishing Between Fresh and Old Oils.—Dr. August Belohoubeck finds petroleum ether, which boils at about 104° F. (40° C.), to be a cheap reagent for certain volatile oils, which have become old and oxidized. Fresh oil of turpentine mixes in all proportions with this naphtha, and the mixture remains clear, while lumps of resin separate from the old and oxidized oil.

This experience induced the author to extend the experiments to other essential oils similar to turpentine, and it was expected that oil of lemon, of orange peel, and of juniper, would act in the same way towards petroleum ether. Experiment confirmed this expectation. Not merely the oils named, but many other fresh oils, could be distinguished in this way from older oils, viz., the oil of aniseed, fennel, peppermint, mint, and rosemary. Besides these, he also tried old *oleum carophyllorum*, *carvi*, *macidis*, *cinnamomi*, *salviæ*, *serpylli*, and *thymi*, but the author could not compare the results with those of fresh oils of the same kind, because he had none of the latter on hand.

The experiment is performed by dropping one drop of the oil into a dry test tube, and then a drop of naphtha, and observing whether the mixture remains clear or becomes turbid. If no turbidity is produced, two, and then three drops of the naphtha are added, to be certain of the absence of resin, and that no opalescence is produced.—Amer. Jour.

Phar., Jan. 1883, 19–20, from Chem. Jour., Nov. 10, 1882; Liqueur Fabrikant.

Essential Oils — Improvement of Odor, etc.—Mr. Percy Wells calls attention to a very simple and inexpensive plan for improving the odor and quality of essential oils, and preventing the decomposition of distilled waters. It consists in adding permanganate of potash to the water with which the oils are distilled, in sufficient quantity to give it a faint pink tint. Rose, elder-flower, or orange flower water, which are partly spoiled, will recover their odor and not again change under this treatment.—Phar. Jour. Trans., May 12, 1883, 918.

Blue Volatile Oils—Products of Fractioning, etc.—On the fractional distillation of the volatile oils of German chamomile, wormwood and yarrow, Carl Hock obtained the first fractions colorless; those obtained above 150° C. were greenish or blue-green, and those passing over at and above 260° C. were intensely blue. A considerable quantity of blue distillate was also obtained from the oil of elecampane. It is known that on the dry distillation of galbanum, a blue oil is produced. A. Kachler (1876) reported on a blue oil from the so-called aromatic Peruvian guaiac resin, and on blue fractions from oil of valerian; and Flückiger ("Phar. Chemie," p. 309) on blue oils from sumbul, puchury, patchouly and asafœtida. Hock finds that all these blue oils show in the spectroscope three absorption bands in red and orange; they distil at 260° C. and give a colorless vapor, not blue as was stated by Kachler (1871), for oils of galbanum and German chamomile. Though the blue compound seems to pre-exist occasionally in the plant, Hock regards it as being mostly produced by decomposition at an elevated temperature. Old resinified oils were found to yield a larger amount of the blue product, which in contact with air is easily altered, turning to dingy brown.—Amer. Jour. Phar., April 1883, 198, from Archiv d. Phar., Jan. 1883, pp. 17, 18.

Volatile Oils—Action of Pentabromide of Iodine.—Mr. Chas. McClellan Forney prepared pentabromide of iodine, IBr_5, by dissolving 127 grains of iodine in 400 grains of bromine. All the oils used were of the best commercial quality, and pure. The test was applied by placing 5 or 6 drops of the volatile oil on a watch-crystal and adding 1 drop of the pentabromide. Corresponding experiments were performed, also, with the same volatile oils previously mixed with 25 per cent. of oil of turpentine and the same proportion of 95 per cent. alcohol. Croton oil was examined in the same manner. The results are tabulated as follows:

OILS.	Pure Oils.		Oils + 25 per cent. Oil of Turpentine		Oils + 25 per cent. Alcohol	
	Reaction.	Color	Reaction.	Color	Reaction	Color
Almond, bitter	None.	Orange-red	Slight reaction and sputtering	Brownish yellow	None	Orange red
Amber, rectified.	Slight.	Cloudy green, dark precipitate.	Brisk effervescence, slight sputtering	Brown red	Slight effervescence.	Cloudy olive, black precipitate
Anise.	Violent, sputtering.	Brown red.	Very violent.	Yellowish brown.	Brisk slight effervescence and sputtering	Brown red.
Bay.	Violent, brisk effervescence, sputtering	Brownish green.	" "	Colorless or yellowish	Brisk, slight effervescence and sputtering	Olive-green.
Bergamot.	" " " "	Olive-green	" "	Brownish then greenish yellow.	Brisk, slight effervescence and sputtering	Brownish.
Camphor.	" " " "	Brownish red	" "	Brownish red.	Brisk effervescence.	Brown red.
Caraway.	" " " "	Greenish-yellow.	" "	Reddish brown.	Slight effervescence.	Cloudy, brownish yellow
Cassia.	Slow, slight effervescence.	Greenish brown	Brisk effervescence.	Cloudy, blackish brown.	" "	Yellowish to greenish-brown
Cinnamon, Ceylon.	Violent, brisk effervescence, sputtering	Cloudy, blackish brown	Very violent.	Olive-green, then greenish black.	" "	Brown red.
Cloves,	" " " "	Brown sediment.	" "	Dark brown	Brisk, slight effervescence.	Cloudy, yellow.
Copaiba.	Slight, gentle effervescence, green vapors.	Green.	Brisk, effervescence, green vapors.	Brownish, then olive green black precipitate	Slight, green vapors.	Green
Croton.	None.	Greenish-yellow.	Brisk effervescence.	Brown red	None.	Cloudy, yellow.
Cubeb.	Violent, brisk effervescence, sputtering	Greenish yellow, dark green upon mixing or stirring	Very violent	Cloudy, inky, then clear olive green.	Like pure oil	Dark to light green.
Fennel.	" " " "	Brown red	" "	Dark brown	Slight effervescence	Red-brown
Hemlock	" " " "	Brownish-yellow.	" "	Brownish yellow.	Brisk, slight effervescence and sputtering	Cloudy, yellowish-brown
Horsemint.	" " " "	Brownish red	" "	Straw yellow	Brisk effervescence.	Brownish-red
Juniper.	" " " "	Green, black precipitate	" "	Sea green	Brisk, slight effervescence and sputtering.	Green and brown layers; after mixing, dark green
Lavender.	" " " "	Greenish-brown	" "	Greenish brown	Brisk, slight effervescence	Yellowish brown
Lemon.	" " " "	Brownish yellow.	" "	Cloudy, dark yellow	Brisk, slight effervescence and sputtering.	Yellow and brown layers not miscible
Orange.	" " " "	Black precipitate.	" "	Cloudy, dirty violet then clear dark yellow.	Brisk, slight effervescence and sputtering	Brownish yellow brown precipitate
Pennyroyal.	" " " "	Cloudy, blackish-brown.	" "	Dark brown.	Like pure oil, less sputtering	Dark brown.
Peppermint.	" " " "	Cloudy, blackish-brown.	" "	Cloudy, purplish-black, then bluish-black and inky-green	Brisk, slight effervescence and sputtering	Bright green, then cloudy
Pimenta.	" " " "	Greenish-brown.	" "	Greenish-brown.	Brisk, slight effervescence and sputtering	Cloudy greenish-brown.
Rosemary.	" " " "	Reddish-brown	"	Reddish brown.	Like pure oil	Reddish-brown
Sassafras.	" " " "	Yellowish, then light gray	" "	Reddish yellow	" "	Light brown
Savin.	" " " "	Greenish brown	" "	Greenish-brown.	Brisk, slight effervescence and sputtering	Cloudy, yellowish-brown
Spearmint.	" " " "	Brownish yellow	" "	Reddish-brown.	Brisk, slight effervescence and sputtering	Brownish-yellow
Spruce.	" " " "	Dark brown.	" "	"	Brisk, slight effervescence and sputtering	Light brown.
Tansy.	" " " "	Brownish-yellow, then colorless	" "	Reddish yellow.	Brisk, slight effervescence and sputtering.	Yellow and red layers, not miscible
Wintergreen.	Slight gentle effervescence.	Reddish-brown.	More active than with pure oil	Straw color.	Slight effervescence.	Cloudy yellow.

The behavior of the oils of cinnamon, cubeb, juniper, lemon, orange, peppermint, and tansy, under the above circumstances seems to deserve attention. Except in a few instances, violet and orange-colored vapors were evolved during the reaction. The reactions were increased in the presence of oil of turpentine and diminished with alcohol.—Amer. Jour. Phar., Nov. 1882, 546–547.

Essential Oils—Properties of Several.—F. Beilstein and E. Wiegand have examined three essential oils obtained from the well-known firm of E. Sachsse & Co., of Leipzig.

Oil of Erechthites (Oil of Fireweed).—This consists almost entirely of terpenes $(C_{10}H_{16})x$. From the portion boiling below 200° C. a terpene $(C_{10}H_{16})$ boiling at 175° C. could be isolated by repeated fractionation, finally over metallic sodium. Specific gravity 0.838 at 18.5° C. It absorbs one molecule of hydrochloric acid without separating a crystalline compound.

A considerable portion of the oil boiled above 200° C. The fraction passing over, on repeated distillation, between 240° and 310°, corresponded, after re-distillation, over sodium, exactly to the formula $C_{10}H_{16}$.

Oil of Erigeron Canadense (Oil of Canada Fleabane).—The chief portion of the oil consists of a terpene $C_{10}H_{16}$, which, after repeated distillation over sodium, had a constant boiling-point at 176° C. (the thermometer being wholly immersed in the vapor). Spec. grav. 0.8464 at 18° C. It absorbs two molecules of hydrochloric acid. If thus saturated and allowed to stand in the cold, crystals of terpene-dihydrochloride ($C_{10}H_{16}.2HCl$; melting at 47° to 48° C.) are separated.

Oil of Marjoram.—From the first portion of the distillation of this oil, a terpene $C_{10}H_{16}$ was isolated, which boiled at 178° C., the thermometer being wholly immersed in the vapor. Spec. gravity 0.8463 at 18.5° C. It absorbs one molecule of hydrochloric acid without forming a solid compound.

The portion boiling at 200°–220° corresponded to the formula $C_{15}H_{26}O$ $C_{15}H_{24}.H_2O$. The substance used in the analyses had been boiled for several hours with sodium and then been distilled over it. Analysis showed that this did not alter the composition.

The formula $C_{15}H_{26}O$ corresponded to a sesqui-terpene-hydrate ($C_{15}H_{24} + H_2O$); but, as is shown by its behavior towards sodium, it does not contain a hydroxyl-group.—New Rem., Feb. 1883, 57, from Berl. Berichte, 1882, 2,854.

English Oil of Lavender—Character, etc.—Referring to some experiments with French oil of lavender made by Mr. Bruylants in 1879, Mr. W. A. Shenstone communicates the results of some experiments made by him about six years ago with English oil of lavender, and which were not completed on account of the loss of the material by fire. These incomplete experiments have, however, become of interest since the publication of Mr. Bruylants' paper, with which they afford a very instructive comparison. The two papers show that the English and foreign oils differ very decidedly in the amounts of terpine they contain ; that in each case it is a terpene yielding a crystallizable hydrochloride which is present; and that probably neither of the oils contains much crystalline constituent, but that both, and this applies particularly to the English oil, are chiefly composed of one or more liquid oxygenated bodies, which there is reason to believe yield camphor on oxidation, and which appear to undergo some degree of change during distillation. The statement in the books that lavender oil contains a hydrocarbon boiling at 200° to 210° C. is doubtless incorrect, as analysis (made by Dr. Morris for Mr. Shenstone) shows that the distillate collected at near that temperature contains a large amount of oxygen.—Year-book of Pharm., 1882, 411–416.

Oils of Cinnamon and Cassia—Physical and Chemical Distinction.—Mr. A. H. Jackson has distilled the volatile oil from the barks of *Cinnamomum Zeylanicum* and the bark, whose source is variously ascribed to *Cassia lignea*, *Laurus cassia*, and *Cinnamomum aromaticum*, obtaining from each about ½ per cent., and subjected them to chemical and physical examination. The oils had a pale brown color, distinctive and characteristic odors, sweet taste, the cinnamon being more fiery than the cassia. The mean of two determinations fixes the density of the cassia oil at 1.0366, and cinnamon at 1.0097 in vacuo and compared with water at its maximum density. The refractive energy of the cinnamon oil is .32102, and of the cassia .28685. Experiments made by fractional distillation and by Bertagninic method (treatment with saturated solution of bisulphide of potassium, whereby a white crystalline magma separates) showed the oils to be alike in their behavior, each containing the same apparent amount of cinnamaldehyde. The difference, if any, must be in the small amount of liquid portion remaining after treatment with bisulphite of potassium, but the quantity of material was not sufficient for further investigation. Yearbook of Pharm., 1882, 395–400.

Oil of the Leaves of Cinnamom. Zeylan.—New Examination.—Mr. Ed. Schaer has had opportunity to subject a small sample of oleum. folior. cinnam. zeylan. to physical and chemical examination, and compares his observations and results with those obtained by Stenhouse in 1854 (Phar. Jour. and Trans., xiv. 319). The present sample—which is authentic—being probably more recent than that examined by Stenhouse, is somewhat lighter in color (faint brownish-yellow) and perfectly limpid; whilst in odor and taste it corresponds with Stenhouse's description. Its sp. gr. is somewhat lower, being 1.049 at 18.5°C. It is neutral in reaction and deflects polarized light faintly to the left. In conformity with Stenhouse's observation it is mainly composed of eugenol, but contains a much smaller propertion of the hydrocarbon (resembling, but not identical with, the light oil of cloves). Experiments also proved the absence of cinnamic aldehyde, as already observed by Stenhouse, but the oil appears to contain a small quantity of an aldehyde-like body, which has not been further identified.—Arch. d. Pharm., July 1882, 492–498.

Oil of Turmeric—Characters and Components.—Messrs. C. L. Jackson and A. E. Menke have extracted an oil from Bengal turmeric by means of light petroleum. When freed from the higher boiling portion of the solvent by heating to 150°C in a flask, it remained as a thick oily yellow liquid having a pleasant odor. By fractioning under diminished pressure three portions were obtained, the first boiling below 193°C, the second between 193° and 198° C, and the third remaining as a viscous residue. The second portion was nearly pure

Turmerol; the first was turmerol contaminated with hydrocarbons from the petroleum spirit. By distilling the second portion in a vacuum, pure turmerol was obtained. This has a composition corresponding to the formula $C_{19}H_{28}O$. It is a pale yellow, has a pleasant, moderately strong aromatic smell, and a sp. gr. of 0.9016 at 17° C. It is optically dextrogyrate, boils under ordinary pressure at 285–290° C., but decomposes at the same time, forming a substance of lower boiling point. It is practically insoluble in water, but mixes readily with all other ordinary solvents. It is an alcohol, convertible by heating at 150° C. with strong hydrochloric acid into *turmeryl chloride*, $C_{19}H_{27}Cl$, a pale brownish fragrant oil, decomposed by distillation.—Amer. Chem. Jour. iv., 368–374.

Mint Oils.—Differences as obtained from the same species, etc. See *Japanese Peppermint Plant*, under "Materia Medica."

Oil of Anise.—Perfect solubility of the true oil in the *Tinct. Camphoræ Composita*, B. P., which see under "Pharmacy."

Oil of Athrosperma Moschata.—See *Athrosperma Moschata*, under "Materia Medica."

Oil of Thyme—Test for Thymol.—Oil of thyme is conveniently tested for thymol, according to Hager, by spreading half a drop of it, by means of a small cork, upon a glass slide, so as to occupy 4 or 5 square centimeters. The thymol begins to separate, within three or four minutes, in the central portion of this liquid, in numerous minute bodies, recognizable with the naked eye; subsequently they appear also towards the margin, but less numerous. Under the microscope they appear at first amorphous, but after an hour or two, are easily recognized as crystals.

For the separation of thymol by means of caustic soda, it is necessary to distil the oil, collecting the fraction up to 220° C., and treating the residue with hot soda lye.

Or 2 volumes of the colorless oil are dissolved in 6 volumes of ether; add to this solution 1 volume of concentrated sulphuric acid, drop by drop, so as to avoid heating, agitate the mixture and set aside. It should rapidly separate into two equal layers, of which the upper one is but little colored, while the lower one is deep red. Should the oil contain little thymol, the mixture separates slowly, and the lower layer is mostly more than one-half, and instead of being red, is merely pale yellow or reddish-yellow.—Amer. Jour. Phar., Sept. 1882, 458, from Phar. Centralh., 1882, No. 27.

Thymol—Distinctive Reaction from Carbolic Acid.—A mixture of 1 part of carbolic acid, 1 part of thymol, and 9 parts of alcohol, treated with ammonia and hypochlorite of sodium, was found, by A. Fabian, to turn greenish-blue, which tint remained on diluting with alcohol, and afterwards with ether. On being diluted with water, the liquid became almost entirely colorless, and, after the addition of ether, shaking and allowing to settle, the liquid became clear, forming two layers; the upper having a rose-red tint, and the lower one being blue. The former indicates the presence of thymol, the latter that of carbolic acid. If alcohol be added to this mixture, the color of the ethereal layer disappears, both layers coalesce, and the liquid assumes its former greenish-blue color. A new addition of ether, however, again produces the rose-red tint, which may be again destroyed by the cautious addition of alcohol; and this change of color may be varied, repeatedly, by the careful alternate addition of either one or the other liquid.—New Rem., Feb. 1883, 53, from Wiadom. Farmaceut.

Dichlorocamphor — Preparation and Characters. — According to P. Cazeneuve and Didelot, camphor is dissolved in absolute alcohol, and treated with a current of dry chlorine for several hours at 80 to 90°. Heat is developed and hydrochloric acid is given off in large quantity. The product is repeatedly treated with water, and heated then to remove chloral and hydrochloric acid. On cooling, it solidifies to a crystalline mass, which may be purified by crystallization from alcohol. The *dichlorocamphor*, $C_{10}H_{14}Cl_2O$, thus obtained, forms large white oblique prisms, slightly soluble in cold, but very soluble in hot alcohol; soluble in ether, in the vapor of which it liquefies, but insoluble in water. It softens at 89°, and melts at 93°, at which temperature it gradually volatilizes without decomposition. Above 150° it blackens and decomposes, with evolution of hydrochloric acid. On continued heating, the temperature rises to 263°, at which point it remains constant, and a colorless liquid distils over.

Dichlorocamphor is insoluble in water, but imparts to it its peculiar odor. When placed on the surface of water, it exhibits gyratory movements, similar to those of camphor. It is insoluble in cold, but readily soluble in hot alcohol, in chloroform, carbon bisulphide, and ether. The ethereal solution crystallizes with difficulty, and the ether appears to form a molecular combination with the dichlorocamphor. The latter, unlike camphor, is insoluble in acetic acid. It combines with aldehyde in aqueous solution, forming a liquid heavier than water, but does not liquefy when triturated with chloral hydrate. Its sp. gr. is 4.2; it melts at 96°, and solidifies at 95°, but remains soft and pasty below 70°. The monochloro-camphor described by Wheeler melts at 95°. The rotatory power of dichlorocamphor for $[\alpha]_j = + 57{\cdot}3^\circ$, and is constant in both alcohol and chloroform.—Am. Jour. Phar., Oct. 1882, 511, from Compt. Rend. vol. 94, through Jour. Chem. Soc., July, Aug. 1882.

Dibromocamphor—Existence of Two Isomeric Forms.—J. Kachler and F. V. Spizer have determined the existence of two isomeric modifications of dibromocamphor, which they designate respectively *α* and *β*.

α. Dibromocamphor is obtained by heating 1 mol. monobromocamphor with 1 mol. bromine in sealed tubes at 120°, and separates from the resulting syrupy liquid as a crystalline mass, which dissolves with moderate facility in alcohol, and is deposited therefrom in prismatic needles melting at 61°.

β. Dibromocamphor is obtained by heating monobromocamphor with bromine in the ratio of $C_{10}H_{15}BrO$ to 3Br for six or eight hours in sealed tubes at 120 to 125°, whereby a brown syrup is formed, which slowly deposits crystals, and when mixed with absolute alcohol, immediately yields a pulverulent crystalline mass, only slightly soluble in alcohol, even at the boiling heat, and separating from the solution in thick rectangular plates, having also the composition $C_{10}H_{14}Br_2O$, but melting at 114 to 115°. The mother-liquor contains monobromocamphor. The *β*-modification of dibromocamphor is also formed by heating the *α*-modification with 2 at. bromine in sealed tubes at 120 to 125° for six to eight hours. A red laminar sublimate then forms in the upper part of the tube, apparently consisting of an unstable compound of $C_{10}H_{14}Br_2O$ with bromine, which it gradually gives off, leaving *α*-dibromocamphor (m. p. 61°). The greater part of the product, however, is a brown-red viscid liquid, which, when mixed with alcohol, immediately deposits a crystalline powder, having, after recrystallization from alcohol, the composition $C_{10}H_{14}Br_2O$, and melting at 114–115°, which is the characteristic melting point of *β*-dibromocamphor.

The differences between the two modification are shown in a table, to which reference may be had in Amer. Jour. Phar., Oct. 1882, 510, from Jour. Chem. Soc., Aug. 1882, 864, and Monatsh. Chem. iii.

Oil of Gaultheria—Yield.—Wm. P. Underhill has distilled this oil since 1874, and gives the average yield as 10 pounds from a ton of the leaves, the highest yield being 14, and the lowest 9 pounds of oil. The larger yield is obtained when the season is dry. The cost of the leaves delivered at the mill is 1½ cents per pound, and it is very difficult to obtain leaves at that price. Since it will require about 200 pounds of leaves to make one pound of oil, the cost of the latter is $3.00 for the leaves alone. The author does not believe that the large sleazy leaves of New Jersey yield more oil than the stiff, hard and brittle leaves of New Hampshire.—Amer. Jour. Phar., April 1883, 197, from Proc. N. H. Phar. Assoc., 1882, p. 34.

Mustard Oils—Preparation.—A. W. Hofmann states that the mustard oils are best prepared from the disubstituted sulpho-ureas by treating them with a concentrated aqueous solution of phosphoric acid. The sulpho-ureas are easily obtained by treating carbon bisulphide with the amines. Starting with carbon bisulphide and aniline we get diphenyl-sulpho-urea, $CS(C_6H_5)_2H_2N_2$; and when this is treated with phosphoric acid it breaks up directly into aniline and phenyl-mustard oil, thus:

$$CS(C_6H_5)_2H_2N_2 = C_6H_5(NH_2) + \underbrace{C_6H_5NCS}_{\text{Mustard oil.}},$$

—Amer. Jour. Phar., Jan. 1883, 48, from Amer. Chem. Jour., Oct.; Ber. d. Deutsch. Chem. Ges. [15], 985.

Artificial Oil of Bitter Amonds (Benzaldehyde).—Preparation from *Toluene*, which see above.

Sanitas Oil—A New Antiseptic and Disinfectant.—Sanitas oil is oil of turpentine which has been exposed while floating upon water to a blast of hot air, whereby it is oxidized and increased in density. The water having dissolved some of the products of oxidation forms the *sanitas fluid.* The properties are antiseptic and disinfectant; the oil, it is said, equals in effect carbolic acid, thymol and iodoform, and is neither caustic nor irritating. One part of the fluid to ten parts of water is used as a gargle in ulcerated throat, and a deodorizing mouth-wash is prepared from ten to twenty drops to one ounce of water.—Amer. Jour. Phar., Mar. 1883, 142, from South. Dent. Jour., 1883, January, p. 523; London Dent. Record.

ALCOHOLS.

Alcohol—Rectification Under Diminished Pressure.—Several processes and apparatuses have lately been described, for the rectification of alcohol at a diminished pressure. One of them, patented by the "Compagnie Industrielle des Procédés Raoul Pictet," of Paris, is described in "New Remedies" (Nov. 1882, 333). The description is accompanied by an illustration of the different parts of the apparatus.

Absolute Alcohol—Test.—Permanganate of potassium being insoluble in alcohol absolutely free from water, this salt has been prepared as a test. The presence of water is indicated by the color assumed, and the best samples of absolute alcohol will soon absorb sufficient water from the atmosphere to dissolve some of the permanganate.—Drug. Circ., Sept. 1882, 130.

Alcohol—Rules for Reduction to any Required Strength.—Mr. Gustavus Pile criticises the action of the revisers of the Pharmacopœia in adopting the tables of Hehner, and draws attention to some inaccuracies resulting from this adoption. He also appends to his interesting paper the following rules, which will be found of service in making alcoholic mixtures for preparing tinctures, etc.:

1. To reduce alcohol to any required strength. To as many parts of the given alcohol as are indicated by the percentage required, add sufficient water to make the number of parts of the mixture equal to the percentage of the given alcohol. Example: It is desired to make an alcohol of 30 per cent. from one of 95 per cent. Take 30 fluidounces of the alcohol and add a sufficient amount of water to make 95 fluidounces.

2. To make any required quantity of any per cent. As the percentage of the alcohol given is to that of the alcohol required, so is the quantity desired to the quantity of the alcohol to be taken. And to this quantity of alcohol sufficient water must be added to make up the required quantity. Example: It is desired to make 80 fluidounces of 75 per cent. alcohol from that of 95 per cent. As $95 : 75 :: 80 : 63\frac{3}{19}$. This represents the number of fluidounces of 95 per cent. alcohol that is to be made up to 80 fluidounces by the addition of water.

By these rules allowance is made for any contraction that may take place, and a mixture after being made should be allowed to stand for a short time for such contraction to take place, when a final amount of water is to be added to make up the full measure.—Amer. Jour. of Phar. June 1883, 303–305.

Ether—Relative Value when Prepared with "Rectified" Methylated Spirits of Wine.—The observations of Dr. Bendelack Hewetson seem to show that ether prepared from methylated spirits of wine is safer and more desirable than that made from rectified spirits of wine—the latter producing more sickness and laryngeal spasms in certain cases in which there is a tendency to such complications.—New Rem., Jan. 1883, 12, from Chemist's Journal.

Acetic Ether—Commercial Quality, and Proposed Method of Manufacture.—Mr. Wm. Inglis Clark has subjected eight samples of acetic ether (two from Scotch houses, one of German manufacture, and the other believed to be English, from London), to chemical examination. The amount of real ether was estimated by the method recommended in Allen's "Organic Analysis," vol. i., p. 141; the alcohol, by a method dependent upon the regeneration of alcohol from the acetic ether present, and the estimation of the total quantity; then deducting the amount chargeable to acetic ether previously found. The "*modus operandi*" is as follows:

Estimation of Alcohol in Acetic Ether.—In a flask connected with an inverted Liebig's condenser, place 200 cc. of the ether under examination along with 200 cc. of water, and about 120 grams of caustic potash in sticks. In a short time reaction spontaneously occurs; but to complete this, the flask is heated on a water-bath for two hours, and allowed to cool. Another 200 cc. of water are now added, and distillation carried on till 500 cc. in all have passed over. This contains all the alcohol, and it may be readily estimated by the hydrometer (the author recommends Sikes'), or the careful determination of specific gravity. By subtracting the amount corresponding to the acetic ether known to be present, we know how much was present as alcohol.

The following table shows the approximate percentage composition of the eight commercial samples of acetic ether above referred to:

	A.	B.	C.	D.	E.	F.	G.	H.
Acetic ether . . . . . . ($C_2H_5C_2H_3O_2$.)	90.14	74.80	67.02	60.00	46.10	41.70	31.40	30.60
Alcohol, absolute . . . . (C_2H_5OH.)	7.20	22.80	21.93	24.30	37.40	33.40	48.00	32.80
Ac. acetic, glac . . . . . ($HC_2H_3O_2$.)	Trace.	0.90	0.30	0.40	Trace.	2.00	1.10	7.00
Water, ether, etc	2.66	1.50	10.75	15.30	16.50	22.90	19.50	29.60

The author has, furthermore, made exhaustive experiments to determine a method for the preparation of acetic ether which should give uniformly good results, and recommends the following modification of the Br. Pharm. process for adoption in the next Pharmacopœia:—

Rectified spirit	283 cc.
Sulphuric acid	283 cc.
Dried sodium acetate	351 grams.

Place the alcohol in a copper or glass flask, and, under precautions to keep cool, add the sulphuric acid. Allow to stand until the temperature has fallen to 60°F, and gradually add the sodium acetate, with constant agitation to insure thorough mixture, keeping the flask as cool as possible, and connecting it with an inverted condenser to avoid loss. When all has been added, distil by means of a naked flame or sand-bath till 400 cc. have passed. Digest the distillate for three days with 2 ounces of freshly dried potassium carbonate; filter, and distil the filtrate by the aid of a water-bath, stopping the distillation before the last ounce has passed over.

The acetic ether so obtained contains 99.36 per cent. real acetic ether and has the sp. gr. 0.9023. The great diversity respecting the sp. gr. of pure acetic ether as given by different observers is doubtless due to the presence of impurity, the latest authorities giving the following: B. P. (corrected addendum)= 0.900; U. S. P. (1883)= 0.889 to 0.897; Mendelejef and Allen — 0.898. A comparison of the author's formula with the B. P. formula makes it probable that the formula from which the B. P. process was constructed contemplated parts by weight only, instead of measure and weight.—Phar. Jour. Trans., March 24, 1883, 777–783.

Chloroform—Detection and Removal of Impurities.—Ivon gives the following method: Potassium permanganate is reduced by impure, but not by pure chloroform. A solution of 1 gram of potassium permanganate in 10 grams of an alcoholic potassa solution and 250 grams of water, which possesses a beautiful violet color, assumes immediately upon the addition of impure chloroform a green color. The liquid then becomes colorless, and oxide of manganese is separated. The author purifies the chloroform by dissolving potassium permanganate in the smallest possible quantity of water, adding 20 grams of caustic potassa, and mixing this solution in a large bottle with the chloroform, which is agitated from time to time. After some hours it is decanted, and a new solution added until, even after standing for some hours, the red color remains permanent. The chloroform is then poured off, deprived of water by means of potassium carbonate, and distilled.—Amer. Jour. Phar., Dec. 1882, 597, from Giorn. Farm. Chim., 31, 193, through Biederm. Co-Bl.

Iodoform—Disguising Its Odor.—Under the name of *Carbolized Iodoform*, Dr. Shirk gives the following compound, which he recommends on the ground that the odor of the iodoform is completely covered, and is not again developed, even at an elevated temperature:

Iodoform	10.00	grams.
Carbolic acid	.05	"
Oil of peppermint	2	drops.

Mix the iodoform and acid by trituration, and then add the peppermint oil.

—New Rem., Mar. 1883, 92, from Berl. Klin. Wochenschr.

Another method of disguisiug the odor of iodoform is said to be the following: Iodoform, ℥ss; oil of eucalyptus, ʒss. This, when mixed with 4 ounces of petroleum ointment, has an odor which is said not to resemble iodoform.—Ibid., p. 88.

Aldehydes—New Reaction.—F. Penzold and E. Fischer have found that upon mixing diabetic urine with an alkaline solution of diazo-benzol sulphonic acid there appeared, after from 10 to 15 minutes, a red color which gradually assumed a violet tint. The same behavior was shown by a solution of pure grape sugar, and the authors recognized the reaction as one common to the aldehydes, for the detection of which it can be applied. For the application of the test the diazo-benzol sulphonic acid is each time freshly dissolved in about 60 parts of cold water and a little solution of caustic soda, the substance to be tested, mixed with dilute alkali and a few particles of sodium amalgam, are added, and the solution allowed to repose. In the presence of an aldehyde there appears after from 10 to 20 minutes the reddish violet color. In the case of bitter almond oil, it may still be detected in the dilution of 1:3000 with perfect certitude.—Amer. Jour. Phar., June 1883, 300, from Ber. d. Deutsch. Ch. Ges., 1883, 657, through Chem. Ztg., 1883.

Paraldehyde—A New Hypnotic.—The actions of this substance were first studied by Dr. Cervello, of Palermo, and his experiments were made in the laboratory of Experimental Pharmacology at Strassburg, under the direction of Schmeideberg. Professor Morselli, of the Royal Asylum of Turin, has, in conjunction with Dr. Bergesis, the assistant medical officer, made an extensive series of observations with it. Its chemical composition is $C_6H_{12}O_3$, and it is a polymeric form of aldehyde. In physiological action it strongly resembles chloral. A dose of 3 grams (45 grains) procures quiet and refreshing sleep for from four to seven hours. It differs from chloral in its action on the circulatory system, strengthening the heart's action, while diminishing its frequency. It has also a well-marked action on the kidneys, greatly increasing the flow of urine. The skin is not at all affected. The drug does not give rise to digestive disturbances, to headache, or to any other unpleasant symptom. Up to the present, Professor Morselli has used paraldehyde about 350 times. He has found it a valuable remedy in mania, melancholia, and other nervous affections, as well as in the sleeplessness that accompanies acute bronchial catarrh, lobar pneumonia, and heart diseases. He believes that it will to a large extent take the place of chloral.—New Rem., April 1883, 120, from Brit. Med. Journ.

Acetal—Detection.—The frequent application of acetal in medicine recently has induced Grodzki to ascertain a method whereby even small amounts may be detected: Acetal is converted by acids, in aqueous solution, into aldehyde and alcohol, both of which in alkaline solution with iodine yield iodoform, while acetal itself is not thus affected. If, therefore, to a dilute aqueous solution of acetal a few drops of hydrochloric acid are added, and subsequently solution of sodium hydrate and solution of iodine, a dense yellow precipitate of iodoform is produced.

The high molecular weight of iodoform renders possible the detection of even very small amounts of acetal.—Amer. Jour. Phar., May 1883, 263, from Ber. d. Deutsch Chem. Ges. 16, 512, through Chem. Ztg. No. 24, 1883, 363.

Nitrite of Amyl—Value in the Treatment of Ague.—Dr. Saunders, of Indore, India, reports in the "Indian Medical Gazette" a number of cases of ague successfully treated with amyl nitrite. He asserts that in every instance the disease yielded quickly and permanently to the amyl treatment. He mixes the drug with an equal volume of oil of coriander, to make it less volatile and to cover its odor, and administers it as follows: Four drops of the mixture are poured on a small piece of lint, which is given into the hands of the patient for him to inhale freely; he soon becomes flushed, and both his pulse and respiration are much accelerated, and when he feels warm all over the inhalation is discontinued, as the symptoms continue to increase for some time afterward; a profuse perspiration now sets in, which speedily ends the attack, though in some cases the cold stage merely passes off without any hot or sweating stage. —Amer. Jour. Pharm., Aug. 1882, 427, from Therapeutic Gazette; Cincinnati Lancet and Clinic, April 8.

Absolute Methyl Alcohol.—Solvent action on *Anhydrous Sulphate of Copper*, which see under "Inorganic Chemistry."

Tarconyl Alcohol—A crystalline compound of the leaves of *Tarchonanthus Camphoratus*, which see under "Materia Medica."

Cacodyle—Analogy to the Physiological Action of Curare.—At the Société de Biologié, Paris, Rabuteau announced that he had demonstrated properties analagous to curare in cacodyles, and that, in doses considerably elevated, the substance resembled the arsenical compounds in its physiological properties.—New Rem., Jan. 1883, 3.

Carbolic Acid—Nitrous Ether a Sensitive Reagent.—Prof. J. F. Eykman has observed that if 1 or 1.5 cc. of a very dilute solution of carbolic acid (about 1 : 10,000) be poured into a test-tube, then one to three drops of properly prepared spirit of nitrous ether be added, and afterwards about an equal volume of concentrated sulphuric acid be allowed to flow down the inside of the test-tube, so that two layers are formed, a fine rose color (best observed against a white background) will make its appearance at the line of contact of the two liquids. If the two layers are gradually mixed by swinging the test-tube about, the red zone becomes broader, and finally the whole liquid turns red. This reaction, which is very decided in solutions of 1 in 10,000, is still visible at much higher dilutions, even as high as 1 in 2,000,000. In the latter case, it is best to take a test-tube about ¾ inch wide, into which is poured a layer about 1½ inch high of concentrated sulphuric acid mixed with *one* drop of spirit of nitrous ether; afterwards a layer of phenol solution, about ⅝ to ¾ inch high is carefully placed on top by means of a pipette. After both layers have been gradually mixed by gently swinging the test-tube to and fro, a red tint may still be observed by reflected light. The reaction appears to be produced neither by nitrous nor by nitric acid, but by the formation of other compounds of nitrogen and oxygen (NO?) produced during the decomposition of ethyl nitrite by sulphuric acid.—New Rem., Nov. 1882, 340.

Carbolic Acid—Detection of Organic Acids.—According to W. Bachmeyer, an aqueous decoction of red-wood becomes decolorized by the addition of one drop of a concentrated inorganic acid, but upon the further addition of acid it becomes again red; organic acids produce a permanent decoloration, whereas carbolic acid, or phenol, produces scarcely any change of color.—Amer. Jour. Pharm., April 1883, 193, though Chem. Zeitung, No. 76, p. 1346, from Ztschr. Anal. Chem., 21, p. 552.

Carbolic Acid—Distinctive Reaction from Thymol, which see under "Volatile Oils."

Crude Carbolic Acid—Testing of Commercial Value.—Dr. O. Bach, after referring to the difficulties encountered in determining the quantity of phenol in crude carbolic acid, by the methods hitherto proposed, communicates the following, whereby these difficulties are completely overcome:

Distill 50 cc. of the acid to be tested in a retort, continuing the distillation until solid hydrocarbons begin to form in the condensing tubes. The distillate is collected in a 100-cc. burette, graduated in one-fifth cc., with a glass stop-cock in the lower end. Before beginning the distillation, about 25 cc. of a saturated solution of table-salt is put in the burette, and the level carefully read and noted. If the acid under examination is free from water, the distillate will float on the brine as a clear layer, while, in the other case, the oil, water and brine will form an emulsion. When the distillation is concluded, the burette is corked and gently shaken, when the oil separates quickly and sharply from the salt solution. The increase in the volume of this latter gives the number of cubic centimeters of water present in the acid, and from it the percentage is readily calculated.

To determine the quantity of phenol, it is necessary to remove the solution of salt as completely as possible, for when it is subsequently shaken with caustic soda, if there is any salt present, the carbolate of soda separates in flocks, making an accurate reading difficult. After removing the cork and reading the volume of the oil, the stop-cock is very carefully opened to let the brine run out. If the cock is opened too far, there is danger on the one hand that some of the salt solution will stick to the side of the burette, and on the other, that some oil will be lost when it reaches the narrow part of the burette. After the salt solution has all been removed, the burette is filled to the zero point with a soda solution of about 30° B., a cork is inserted, and the mixture well shaken and left to settle. If the burette is free from grease, the oil separates quickly and sharply, and by turning the burette gently about its axis once, the oil or water drops that adhere to the side can be wiped off so that in half an hour the number of cc. of oil that remain can be read. The difference in the volume of oil before and after shaking equals the volume of phenol, which may be easily converted into percentages.—New Rem., Jan. 1883, 22, from Chem. Zeitung.

Sulpho-carbolates—Variability in Commerce.—Dr. H. P. Farnham draws attention to the variability of sulpho-carbolates, and particularly of the sulpho-carbolate of sodium of commerce. The article which, in his opinion, has been properly prepared, is in the form of beautiful clear crystals, makes a perfectly clear solution, and has the desired therapeutic effect; the other article is an amorphous powder, yields a muddy solution with water, and causes, when administered, disgust and sometimes terrible vomiting and prostration.—New Rem., Feb. 1883, 39.

Sulpho-carbolate of Sodium—Value to Allay Vomiting.—Philip Miall finds this compound in doses of 7 grains in half ounce of water to be very useful as a remedy for the vomiting of pregnancy.—Amer. Jour. Phar., Mar. 1883, 153, from Brit. Med. Jour., through Cin. Lancet and Clinic, Jan. 13, 1883.

Phenacetolin—An Indicator in Alkalimetry.—Mr. W. Fresenius makes some corrections in reference to an article by Mr. Paul Degener, his attention having been drawn to some errors by the subsequent statements of Lunge, who made use of phenacetolin as an indicator in titrating caustic soda in presence of carbonate.

Phenacetolin is scarcely colored *yellowish* by *alkalies* or *alkaline earths;* with *carbonates* it forms a *deep-red* compound, soluble in the case of alkalies, and insoluble in that of earthy bases. *Acids* color phenacetolin distinctly *golden-yellow.* Hence, if a little of the indicator be added to a solution containing carbonate alongside of caustic soda, the liquid is scarcely tinted yellowish; if now acid be added, and there be still some caustic soda present, the liquid will turn momentarily rose red, but, on stirring, will become again colorless. As soon as all the free alkali has been neutralized, and only carbonate is present, the pale-red color remains. (In presence of alkaline earths the carbonates of which are not at once attacked by the acid, after the free base has been neutralized, the red tint first formed may disappear momentarily on the addition of more acid, but will make its appearance again after a short time.) The amount of acid consumed up to this point corresponds to caustic soda. If now more acid be added, the color increases to dark-red, turns to yellowish-red near the end, and, when all the carbonate is neutralized, changes to pure golden-yellow. The amount of acid consumed up to this point corresponds to carbonate. A direct titration of caustic alkali, free from carbonate, with the aid of this indicator, will probably be less successful, since the red tint will not be able to show itself at all, or at least, but momentarily.

In his first communication, Lunge highly recommends phenacetolin as an indicator in titrating caustic soda in presence of carbonate; in his second communication, his criticisms are less favorable, and he recommends it only in those cases in which the amount of carbonate present is not too small. He states, at the same time, that the indicator behaves towards sulphide of sodium in the same manner as towards the carbonate, and that it is also immediately reddened by ammonia.—New Rem., Feb. 1883, 50, from Zeitsch. f. Anal. Chem., 1882, 557.

Pure Beech Wood Creosote—Characters.—Hartman and Hauers have succeeded in preparing creosote from beechwood tar, which is declared by Dr. Ferd. Fischer, one of the editors of *Dingler's Polyt. Jour.*, to be of a degree of purity above any that has hitherto been in the market—to be, in fact, perfectly pure. It is described to be a neutral, clear, pale-yellowish, never reddish or brownish, liquid, which does not acquire, either by age or by exposure to sunlight, a darker tint than that of Rhine wine. It consists of guaiacol and creosol, is strongly fluorescent, and has a smoky, but not acrid, odor. Spec. grav. 1.070, at 15.6 F.; boiling point 205° to 225° C. Soluble in 200 parts of water. If 1 cc. of creosote is shaken with 5 cc. of water, the latter should not acquire either an acid or an alkaline reaction. 2 cc. of creosote shaken with 8 cc. of water and 2 cc. of solution of soda (sp. gr. 1.33), should yield a light yellow, entirely clear liquid, free from opalescence, and not separating any oily drops. 2 cc. of creosote, shaken in a dry test tube, with 4 cc. of benzin, should yield a clear solution at the usual indoor temperature. If the solution is not complete, the presence of a somewhat considerable quantity of carbolic or cresylic acids is indicated. If the solution was complete, and a few drops of water are afterwards added to it, with strong agitation, no oily layer should separate between the water and the benzin-solution, or cooling the mixture down to 20° C. (68° F.). If such a layer separates, carbolic and cresylic acids are probably present, though in smaller proportion. On shaking the benzin-solution with 4 cc. of a cold saturated solution of barium oxide, the benzin-solution should acquire no blue or dirty color, nor should the aqueous solution turn red. These color-reactions betray the presence of other constituents of wood-tar oil. On shaking 2 cc. of creosote with 2 cc. of collodion, the mixture should not become gelatinous. From a mixture of 9 cc. of glycerin of sp. gr. 1.230, 3 cc. of water, and 4 cc. of creosote, the latter should separate completely on standing.—New Rem., Oct. 1882, 303, from Dingl. Polyt. Jour., Vol. 245, p. 91.

Glycerin—Estimation in Fats.—J. David recommends the following process: Saponify the fat by melting 100 grams of it with a sufficient quantity of hydrate of baryta, constantly stirring until the greater portion of the water of crystallization has been driven from the excess of the hydrate. Then remove the heat; add 80 cc. of fifteen per cent. alcohol, and stir until the mass has become firm. Separate the glycerin from the barium soap by boiling it with a liter of water; precipitate the excess of barium from the aqueous solution by means of sulphuric acid;

evaporate the filtrates, and determine the amount of glycerin from the volume and sp. gr. of the evaporated liquid.—New Rem., Nov. 1882, 339, from Compt. Rend., 94, 1477.

Glycerin—Action on Salts of Iron.—Mr. G. F. Schacht has observed that the perchloride of iron in a mixture, composed of tincture of chloride of iron, ʒiss ; glycerin, ʒvj ; and water ad ℥vj, was gradually changed to the ferrous condition. Further inquiry and experiment pointed to the glycerine as the reducing agent. This seemed to indicate the possible utility of glycerin in preserving solutions of ferrous salts, but experiments made in this direction resulted in the negative.—Yearbook of Pharm., 1882, 496–499.

Glycerin—A Spurious Article.—Dr. E. Geissler reports that a firm doing business at Prague (Bohemia), is selling a spurious glycerin, for technical purposes, which was found to be composed of water, chloride of magnesium, glucose, and dextrin. Its spec. gr. was 1.269. When evaporated on the water-bath, it left a residue of a brown color, and which became almost entirely dry and friable at 105° C. It amounted to 53.2 per cent. The firm designated it, in their correspondence, as "glycerin chemically pure," or "chem. glycerin, white, 30°," but stated also that it was unsuited for internal use.—New Rem., Feb. 1883, 53, from Pharm. Centralh.

Glycerin—Impurities.—Mr. Ferdinand Jean has studied and described the adulterations and imperfections in the manufacture of glycerin. He states that *oxide of lead*, *lime*, and *butyric acid* are the impurities most frequently met with in commercial glycerin, and that they accrue from bad manufacture or incomplete purification. He gives the methods for detecting the different impurities and adulterants found in glycerin, and draws particular attention to the importance of detecting *formic* and *oxalic acids*, if present. This may be effected by mixing equal parts of the impure glycerine and sulphuric acid, sp. gr. 1.83, when carbonic acid gas is given off. To distinguish between the two, Mr. Jean proceeds as follows: 1. To a part of the glycerin alcohol of 40° is added, and a drop of sulphuric acid, and slight heat applied; the odor of formic ethyl (peach-flower smell) indicates the presence of formic acid. 2. To equal quantities of glycerin and water add 2 drops of a solution of chloride of calcium containing a little ammonia (free from carbonate); if oxalic acid is present a white precipitate of oxalate of calcium is formed. The *chloroform test* of the author consists in mixing equal parts of chloroform and glycerin, stirring, and then leaving the mixture to settle. The mixture separates in two distinct layers, the upper one consisting of pure glycerin, the lower of chloroform and the glycerin impurities. If the glycerin is pure, the chloroform remains clear; if not, a greyish belt is observed at the point of separation. The author recommends the following test for the detection of *sugar*, *glucose*, *gum* and *dextrin*: 150–200 drops of distilled water are poured on the glycerin to be tested in a porcelain cup; 3 or 4 centigrammes of molybdate of ammonium and a drop of pure nitric acid are added, and the whole is then boiled for half a minute. In the presence of any of the above impurities a blue coloration is produced, and by well-known methods it is easy to distinguish between them. The density of the sample being known, the quantity of water is best calculated by means of Vogel's formula.—Phar. Jour. Trans., Sept. 16, 1882, 224, from Jour. de Phar. d'Alsace-Lorraine, ix., 136.

Glycerin.—Solubility of *Boric Acid*, which see under "Inorganic Chemistry."

Glycerin—Reaction With Borax.—When glycerin is added to a dilute solution of borax, an acid reaction results, which again disappears when the mixture is heated, the liquid becoming alkaline. Donath and Mayerhofer, in the belief that this reaction was characteristic for glycerin, had prepared this reaction as a test for this substance, using litmus as an indicator. Mr. Wyndham R. Dunstan now, however, finds not alone that the color changes are ill-defined, but also that polyhydric alcohols in general produce precisely the same reactions. Instead of litmus, the author uses phenol-phthalein, which gives satisfactory results. When a few drops of the yellow alcoholic solution of this are added to a solution of borax, a rose-red color is produced, owing to the alkalinity of the salt. On adding a little glycerin to this, this color at once disappears, but reappears on heating the liquid, reaching the maximum tint near the boiling point of the solution. The same reaction takes place when the glycerin is replaced by mannite, erythrite, dextrose, levulose, lactose, and mycose; but sucrose (cane-sugar) does not behave in this way. The best results are obtained with a half per cent. solution of borax, and the presence of more than ten per cent. of glycerin should be avoided.—Yearbook of Phar., 1882, 499–501.

Boroglyceride—Antiseptic Value, etc.—The experience of Mr. Thomas D. McElhenie tends to prove the antiseptic value of this new compound (see Proceedings 1882, p. 558). A number of easily putrescible substances, such as eggs, finely-chopped meat, mucilage of gum arabic, solution of gelatin, etc., have kept well when treated with small percentages of the compound. A convenient form for dispensing will be found that of 2-ounce cakes, moulded in oiled camphor ice tins. The cakes should be wrapped in wax paper and tin foil, to prevent hydration, since the compound is quite hygroscopic, and soon becomes damp and greasy on an exposed surface. When operating on 5 lbs. of the materials, the temperature being maintained at 150° C. (302° F.), about a day is required for the completion of the compound, which is known to be finished when it ceases to lose weight and dissolve freely in water at the ordinary temperature. Amer. Jour. Phar., July 1882, 352-354.

Glyceroborate of Calcium and Sodium—Preparation and Antiseptic Value.—Glyceroborates of calcium and sodium are recommended by Le Bon as antiseptics. They are prepared by heating together, with constant stirring, equal parts of borate of calcium or sodium and glycerin, until a drop removed and placed on a glass plate forms a brittle, transparent pearl. Upon being poured out to cool, the product forms a transparent glass very soluble in alcohol and water, which, being very hygroscopic, is broken into fragments and kept in stoppered bottles. The glyceroborate of sodium is soluble in water in all proportions, and even in dilute solutions is said to be a powerful antiseptic, though so non-irritating that a concentrated solution may be applied to the eye and other delicate organs without inconvenience. A simple coating of meat with a varnish of glyceroborate is said to be sufficient for its preservation. The similarity of these products to another recently referred to in these columns is obvious.—Amer. Jour. Phar., Oct. 1882, 507, from Phar. Jour. and Trans., July 29. (Compt. Rend., xcv., 145.)

FIXED OILS.

Neutral Fats—Estimation in Mixture of Fatty Acids.—O. Hausamann has directed attention to the fact that when an alcoholic solution of potassium hydrate is added, drop by drop, to an alcoholic solution of a mixture of free fatty acid and neutral fat, only the former becomes saponified, while the latter remains unchanged.

M. Gröger has confirmed in general the correctness of this statement. He dissolved to this purpose neutral beef tallow in boiling alcohol, added a few drops of an alcoholic phenolphtalein solution and 0.1 cubic centimeter of one half normal alcoholic potassa solution became immediately red, and the color was retained, even at the boiling temperature, for about five minutes, from which it may be seen that the saponification indeed proceeds very slowly. Mr. Gröger gives a method for the separation of the fatty acids from the neutral fat, the details of which will be found in Am. Jour. Phar., Dec., 1882, 596, from Biederm. C. Bl. and Dingl. Polyt. Jour.

Fats—Determination of the Melting Point.—Kratschmer conducts this experiment by bringing the substance to be tested into a capillary tube, placing a drop of mercury upon it, and then sealing the upper end of the tube. At the moment when the body melts, the drop of mercury sinks. The experiment can be repeated as often as desired with the same specimen.—Am. Jour. Phar., Feb. 1883, 91, from Zeitschr. f. Anayt. Chem., 21, 399.

Vegetable Fats—Presence of Free Acids.—Ernst Schmidt and H. Roemer obtained from *cocculus indicus* 23.6 per cent. fat, of which 39 per cent. (0.2 per cent. of the fruit) proved to be stearic acid, which was obtained by dissolving the oil in hot alcohol, precipitating with barium acetate, exhausting the precipitate with petroleum benzin, and decomposing the barium salt with hydrochloric acid.

By fractional distillation, *in vacuo*, of commercial expressed *oil of nutmegs*, myristic and stearic acids were obtained, amounting to 3 or 4 per cent., the last-named acid being present in small quantity.

A very small propoportion of free acid is contained in *laurel oil*, the expressed fat of the fruit of Laurus nobilis; but by exhausting the fruit with hot alcohol 2 to 3 per cent. of fatty acid was obtained, which proved to be a mixture of several acids not yet identified, but possibly containing palmitic acid.—Am. Jour. Phar., April, 1883, 199, from Arch. de Phar., Jan. 1883, 34–38.

Oleic Acid.—Preparation of test solution for hardness of *Water*, which see under "Inorganic Chemistry."

Oleic Acid.—Preparation of *Soap*, which see under "Pharmacy."

Oleates—Remedial Value and Advantages.—Dr. Shoemaker read a paper at the last meeting of the Pennsylvania State Medical Society, in which he claimed the following advantages for the oleates over ordinary ointments: First: Their deep penetration. The oleic acid gives them active ability to penetrate rapidly into the animal economy, and renders any salt with which it is combined more active and effective in dermic medication. Second: Their freedom from rancidity. Third: Their cleanliness of application. Fourth: Their great economy. Fifth: Their antiseptic action. *Oleate of zinc* is of great value in hyperidrosis and osmedrosis and eczema vesiculosum. *Oleate of copper* is of great value in tinea. *Oleate of alumina* is of great value in checking muco-purulent discharges. *Oleate of iron* has a mild astringent action. *Oleate of arsenic* is of value in lupus and the ulcerating variety of epithelioma, and is better borne than other forms of arsenic. The surface must first be abraded, otherwise there is no result. *Oleate of silver* is of value as a local application in erysipelas, and when sprinkled over old chronic ulcers sets up a healthier state of the parts. It is of use in carbuncles and boils, and will often arrest pustulation in its earlier stages.—Am. Jour. Phar., Nov. 1882, 583–584, from Chicago Medical Review, June 1.

Oleate of Uranium—Preparation.—Mr. Walter Gibbons has succeeded in preparing pure crystallized uranium oleate as follows: Pure oleic acid was mixed with an excess (about twice its weight) of uranium oxide, and the semi-liquid mass allowed to stand in an atmosphere of hydrogen, when it became solidified. The solid mass, after standing six days, was dissolved in ether and decanted from excess of uranic oxide. The resulting oleate was crystallized from alcohol, and dried in vacuo. The pure oleate so obtained has a sp. gr. 1.13, but soon changes. For pharmaceutic purposes, it is therefore best to make a comparatively pure compound extemporaneously, by mixing calculated quantities of uranic oxide and oleic acid (using slight excess of the former), and heating it on a water-bath for about half an hour. This will produce a moderately good preparation, which should be mixed with some preparation like petrolatum to exclude it from oxidizing influence.—Phar. Jour. Trans., Mar. 10, 1883, 737.

Pyroleine—A Product of the Distillation of Fixed Oils.—Dr. Don Jaime Arlos, of Tor, has published the results of some investigations of the products of distillation of fixed oils under certain conditions, which he believes will be serviceable towards proving the identity and purity of at least some of them. If two parts of glycerine are distilled with one part of a fixed oil, both substances undergo decomposition, the glycerine losing two molecules of water and passing into the receiver as *acroleine*, forming the denser layer. The upper layer contains the *pyroleine*, an oily, limpid liquid of an acid reaction. If a little be taken up by the points of the index finger and thumb, previously moistened with water, it imparts to them an extraordinary degree of slipperiness. It is insoluble in water, and completely soluble in a little alcohol. When treated with an excess of alcohol, it becomes turbid, and precipitates an oil which is soluble in ether, and an excess of pyroleine. The alcoholic solution of pyroleine, treated with acetate of lead, appears like an emulsionized fat. The author describes particularly the pyroleine obtained as above from olive oil, and finds a marked distinction between this and the pyroleine obtained from mixture of olive and sesame oil, or olive oil and cotton-seed oil. The results of his experiments are summarized in the form of a table, and show interesting distinctions.—New Rem., Jan. 1883, 3-4, from Revista Farmaceutica (Buenos Ayres), 1882, 17-20.

Umbellulic Acid.—A New Fatty Acid from *Laurus Californica*, which see under "Materia Medica."

Butter—Preservation.—Dr. W. Hagemann has observed that cow butter contains 0.5 to 0.6 per cent. of milk-sugar, which under the influence of bacteria is transformed into lactic acid, and this liberates from the glycerides the acid, containing less carbon. It is obvious from this that summer-butter becomes rancid more rapidly and strongly than winter-butter, and that for the preservation of butter two methods may be adopted, viz., either the lower fat acids are removed by soda solution, as proposed by Adolf Mayer and Dr. Clausnitzer, or else the milk-sugar must be removed, or its decomposition prevented by suppressing the vegetation of the bacteria.—Amer. Jour. Phar., Feb. 1883, 95, from Chem. Ztg., 1882, No. 67.

Butter—Testing for Foreign Fats, etc.—According to T. Taylor, a piece of pure butter, to which two drops of sulphuric acid are added, gives a whitish-yellow, untransparent liquid, in which, after about five minutes, a very pale scarlet-red coloration begins to appear at the edges.

Fresh oleomargarin from beef tallow gives immediately a transparent, amber-colored liquid, which, after twenty minutes, appears of a deep carmine-red color; with old and rancid oleomargarin, the liquid becomes dark-brown and untransparent. Plant fats, as, for instance, cocoanut oil, give a pale amber-colored liquid, which, in about thirty minutes, assumes a pale red color, readily changing to violet.

P. Casamayor brings a specimen of the butter, previously melted and freed from any deposit or scum, into alcohol of a definite specific gravity, and observes whether the fat sinks, floats upon the surface, or remains suspended in the liquid. In the latter case the fat has the same specific gravity as the respective alcohol. Pure butter remains suspended at 15° C. (59° F.) in alcohol of the specific gravity 0.926, corresponding to 53.7 per cent. Fat and beef tallow on the contrary are borne by alcohol of the specific gravity 0.915, corresponding to 59.2 per cent. In the examination of a mixed butter it is therefore necessary to form a liquid, by the addition of a specifically heavier or lighter alcohol, in which the specimen just floats. From the strength of the alcoholic mixture a conclusion may be drawn as to the percentage amount of artificial butter in the mixed butter.—Amer. Jour. Phar., Dec. 1882, 596, from Biederm. C. Bl., ii. 344–345, through Chem. Zeitg., No. 34.

Cacao Butter—Composition.—Kingzett announced in 1877 the isolation of two fatty acids having the melting points 57° and 72°C.; the latter was named theobromic acid, and was stated to have the formula $C_{64}H_{128}O_2$. Vander Becke, in 1880, endeavored to prepare the latter, but without success. The subject was recently investigated by M. C. Traub, who examined five samples of oil of theobroma, two of which had been prepared by himself. After saponification the acids were ascertained to be completely precipitated by magnesium acetate, and by repeated fractional precipitation it was proven that the oil consists of the glyceryl esters of oleic, lauric, palmitic, stearic and arachic acids, and that the solid consistence of the oil and its low melting point are most likely due to the peculiar proportions in which these compounds are combined, resembling in this respect the behaviour of certain metals.—Amer. Jour. Phar., April 1883, 198, from Archiv. d. Phar., Jan. 1883, pp. 19–23.

Linseed Oil—Adulteration.—Professor Domingos Freire, of Rio Janeiro, has lately submitted a sample of adulterated linseed oil to analysis, and found it to contain resin oil, resin, a sulphuretted oil, and fish oil. The sample exhibited the property of dichroism, showing a yellowish-red tint by transmission, and a blue by reflection. The resin oil was nearly all separated by distillation, the portion remaining in the retort no longer displaying the phenomenon of dichroism. The presence of resin was proved by boiling for a few minutes with an excess of alcohol of 90°, decanting and treating with neutral acetate of lead, the result being a curdy precipitate showing the presence of resinous matter. The aqueous filtrate was then treated with a solution of silver nitrate, which produced an abundant black precipitate. The oil was then submitted to the action of nitrous vapors; and, on being set aside, deposited a semi-solid reddish-brown mass. The animal oil (fish oil) was detected by passing a current of chlorine through the sample for fifty minutes, which produced a reddish-brown color, passing into violet, blue and black, leaving no doubt as to the origin of the adulterant.—New Rem., Mar. 1883, 79, from Mon. de la Pharm. Belge and Chem. Journal.

Cotton Seed Oil—New Test, and Use for Liniments, Plasters, etc.—Mr. S. S. Bradford draws attention to the value of cotton seed as a substitute for olive oil in liniments (which see under "Pharmacy"), lead plaster, etc., and incidentally found that its behavior to liq. plumb. subacet. may be utilized for its detection in olive oil in quantities of 5 per cent., or even less. If solution of subacetate of lead is mixed with cotton seed oil, the mixture assumes a reddish color in from 12 to 24 hours. This reaction seems to be peculiar to cotton seed oil,—Amer. Jour. Phar., Oct. 1882, 481–2.

Odika—An African Vegetable Fat.—Dr. H. W. Bachelor draws attention to a fat obtained by the natives of equatorial West Africa, from the fruit of the "Aba" tree, and called by them "Odika." It is highly esteemed as an article of food, being made into a thick gravy, and eaten with boiled plantains. The "aba" is one of the most luxuriant and magnificent forest trees of equatorial West Africa. Its plum-shaped fruit is about the size of a goose's egg, of a flattened ovoid shape, and when ripe, a beautiful golden color. It consists of three distinct parts: the rind, the pulp, and the seed. The seed is the most important and useful part. It constitutes about two-thirds of the entire bulk of the fruit, is reniform in shape, and contains a kernel two-thirds the bulk of the seed. This by the crude manipultation of the natives yields the crude fat called "odika," which is not nearer described by the author, but appears to be a solid resembling oleum theobroma, and, when purified, has been used by the author as a substitute for the latter in ointments and suppositories with good results. Some experiments made by Dr. Bachelor seem to indicate that the fat is not easily saponified.—New Rem., Nov. 1882, 322.

Pongamia or Kurung Oil—Medicinal Uses. See *Pongamia glabra*, under "Materia Medica."

CARBOHYDRATES.

Vasculose—Characters and Functions.—Messrs. E. Frémy and Urbain state that vasculose may be obtained from almost any vegetable tissue, but elder pith is preferred as yielding it in a pure state. The pith is first treated with neutral solvents and with dilute alkaline solutions, and is then boiled with weak hydrochloric acid, by which the paracellulose is converted into cellulose; it is subsequently thoroughly exhausted with the ammonio-cupric reagent. The residue is vasculose, which has a slightly yellow color, and preserves the form of the original tissue, although the latter may have lost half its substance by the removal of celluloid matters. Vasculose is insoluble in all neutral liquids, is not changed by boiling with dilute sulphuric, hydrochloric, or phosphoric acid, or by boiling in alkaline solutions; but it is rapidly acted on by oxidizing agents, the products being a series of resinous acids, of which those first formed are insoluble in alcohol, whilst the last formed dissolve in that liquid and also in ether. The prolonged action of atmospheric oxygen appears also to convert vasculose into resinous acids, soluble in alkalies, and this explains the decay of certain woods on exposure to the weather. Vasculose is rapidly changed when heated *under pressure* with alkaline solutions at about 130°; by fusion with potash, it is immediately transformed into ulmic acid This is the source of ulmic acid produced in the same treatment of wood, the cellulose being converted into acetic and oxalic acid. In the distillation of wood, it is more particularly the vasculose which yields the methyl alcohol and the acetic acid. The composition of vasculose is represented by the formula $C_{36}H_{20}O_{16}$.

Vasculose is the substance by which the cells and fibres of vegetable tissues are united, and it sometimes also forms continuous transparent membranes. The hardness of woody tissue depends on the proportion of vasculose contained in it; for instance, the wood of the poplar contains only 18 per cent. of vasculose, whilst ebony has 35 per cent., iron wood 40 per cent., and the endocarps of nuts 60 per cent. Fibres, such as hemp and flax, are connected by layers of vasculose, the greater or less thickness of which affects the process of setting and bleaching; and as this vasculose may be removed by suitable reagents without injury to the strength of the fibres, a certain chemical treatment may hereafter be found of high utility in industrial operations.—Jour. Chem. Soc., July, 1883. 708, from Compt., Rend. 94, 108–112.

Strong and Impervious Parchment Paper—Manufacture.—According to the "Jour. Soc. of Arts," a strong, impervious parchment-paper is obtained by thoroughly washing woolen or cotton fabrics, so as to remove gum, starch, and other foreign bodies, then to immerse them in a bath containing a small quantity of paper pulp. The latter is made to penetrate the fabric by being passed between rollers. Thus prepared, it is afterwards dipped into sulphuric acid of suitable concentration, and then repeatedly washed in a bath of aqueous ammonia until every trace of acid is removed. Finally, it is pressed between rollers to remove the excess of liquid, dried between two other rollers which are covered with felt, and lastly calendered.—New Rem., Oct. 1882, 303.

Pyroxylin—Preparation.—G. Wolf recommends the following process which yields with ether-alcohol a perfectly clear and colorless solution: 20 parts of crystallized potassium nitrate are triturated in a mortar, 36 parts of a sulphuric acid sp. gr. 1.84 are added, and when the mixture has cooled one part of cotton is incorporated with the pestle so as to be uniformly impregnated; after ten minutes the cotton is placed upon a laterally preforated funnel, this is dipped into water, and the water is removed until it ceases to acquire an acid reaction.

J. Bienert operates with a mixture of 6 fluid ounces each of sulphuric acid sp. gr. 1.84, and nitric acid sp. gr. 1.41 to 1.42; when the mixture has cooled to between 20° and 25° C., 6 or not more than 7 drachms of clean cotton are introduced, and the mixture, which is stirred once a day, is set aside from five to eight days at a temperature of 15° to 20° F. The sufficient nitration is observed by the change of the parchment-like appearance of the cotton, and by its becoming soft again, but it is advisable to ascertain its solubility from a sample taken. This gun cotton gives a strong cuticle, and its solution in ether-alcohol is not precipitated by ether.—Am. Jour. Phar., May, 1883, 273, from Phar. Zeitschr. Russl., 1883, p. 4.

Starch—Preparation of by a Permanent Solution for Testing.—Alexander Mueller recommends for this purpose, to triturate the starch with strong solution of caustic potash, whereby, as is well known, it rapidly swells up. By dilution with water a solution is obtained which gradually becomes quite clear, and which is said to keep for years. When using it, however, it is necessary to take care that the liquid to be triturated has sufficient excess of acid to neutralize the alkali of the starch solution.—New Rem., Feb. 1883, 56, from Landw. Vers. Stat., 27, 340, in Zeitsch. f. Anal. Chem.

Pearl Tapioca—Preparation in Malacca—See "*Tapioca*," under "Materia Medica."

Gum Arabic—Influence in Certain Chemical Reactions.—It is known that the presence of certain organic substances in saline solutions may prevent the formation of a large number of precipitates. I. Sefort now records a series of experiments which show that certain neutral bodies, particularly gum arabic, enjoy this property. The observations were made in the following manner:

Two quantities of 10 cc. of the solution to be examined were run from a graduated pipette into two glasses of equal volume; with one of these 3 cc. of solution of gum was incorporated by stirring, and to the other 3 cc. of distilled water was added; finally 10 cc. of sulphuretted solution was added to each, and rapidly mixed. The following table represents what was observed both after a few minutes and some weeks:

	Without Gum.	*With Gum.*
Lead acetate,	Black precipitate,	Clear brown solution.
Silver nitrate,	Black precipitate,	Clear black solution.
Ferrous sulphate,	Black precipitate,	Clear black solution.
Manganous sulphate,	Rosy flesh-colored precipitate.	Clear light brown solution.
Mercuric chloride,	Black precipitate,	Clear dark brown solution.
Copper sulphate,	Black precipitate,	Clear dark brown solution.
Zinc sulphate,	White precipitate,	Clear colorless solution.
Antimonous chloride in solution acidified by HCl.	Orange precipitate,	Clear orange solution.
Arsenous acid,	Citron-yellow precipitate.	Clear citron-yellow solution.

The action of gum upon the formation of certain other precipitates was also studied, the following being the results observed:

	With Gum.	*Without Gum.*
Neutral phosphate of ammonia and calcium chloride.	White gelatinous precipitate.	Clear colorless solution.
Uranium nitrate and potassium ferrocyanide.	Chocolate-brown precipitate.	Clear brown solution.
Very dilute solution of ferric chloride and ammonia.	Brown gelatinous precipitate.	Clear light brown solution.

In a like manner no precipitates were produced in the presence of gum in solutions of 1 in 1,000 of the following alkaloids: quinine, cinchonine, morphia, strychnia, brucia and veratria, by the usual alkaloidal reagents, phosphomolybdate of ammonia, double iodide of mercury and potassium and tannin. If it be remembered that the separation of alkaloids by their reagents has to be effected in the presence of various organic matters that accompany them either naturally or accidentally, these researches acquire for toxicology an unmistakable importance.—Am. Jour. Phar., Dec. 1882, 602–605, from Jour. de Phar. et de Chim. (5), vi, 169, through Phar. Jour. Trans., Oct. 14, 1882.

Algin—A New Gum-like Substance from Sea Weeds.—Mr. E. C. C. Stanford has found that when sea weeds—particularly *Laminaria Stenophylla* and *Fucus Vesiculosus*—are deprived of their adhering salt by washing, the residue will yield to water containing a little carbonate of soda an abundance of a gum- or gelatin-like substance, which he proposes to name *algin*, and which he thinks is calculated to become useful in the arts, and as food for cattle and man. He believes, moreover, that sea weeds can be profitably utilized in this way, and can be made to yield at the same time the usual or even larger quantities of iodine, etc. The sea weed is first of all washed with water by simple maceration, employing a number of vats in the manner usual for lixiviation in alkali works. In this way the salts are very completely removed, the yield being from 12 to 18 per cent. calculated for the air-dry weed in the laminaria; and this is more than is yielded by burning the weed into ash, which, as a rule, does not yield more than 10 per cent. of salts on the air-dried weed.

After the salts have been removed, the weed is bleached by a weak solution of chlorinated lime, about 2° Twad.; and, when sufficiently white, it is soused by a weak solution of sulphuric or hydrochloric acid, and well washed. It is then treated in the cold with about one-tenth its weight of carbonate of sodium for 24 hours, then heated, filtered, and evaporated—the residual cellulose being pressed and utilized as paper material, probably, indeed, as a substitute for rags. The whole of the plant is thus accounted for in the laminaria:

On the Air-dried Plant.

Extracted by water (salts and a mannite-like substance)	30
Extracted by acid	5
Extracted by carbonate of sodium (algin)	35
Cellulose	10
Moisture	20
	100

Obviously, sea-weed that has been exposed to rain, and has consequently become unsuitable for making kelp, may still be utilized for the manufacture of "algin."

Algin may be obtained in horny masses, resembling gum tragacanth, or in thin, transparent, flexible sheets. Its solutions are coagulated by the mineral acids generally, but boracic acid has no effect. Neither have acetic, formic, tartaric, citric, or benzoic acids, nor sulphate of magnesium. Alcohol precipitates it; lime water, baryta water, salts of calcium, barium, and strontium, give white precipitates, and it is also precipitated by salts of copper, zinc, aluminium, tin, antimony, cobalt, and nickel, whilst solution of perchloride of iron gives a dark-brown coagulation.

It is distinguished from albumen by not coagulating on heating, and by not precipitating nitrate of silver; from gelose by not gelatinizing on cooling, by containing nitrogen, by being soluble in cold weak alkaline solution, and by being insoluble in boiling water. From gelatine it is distinguished by not giving any reaction with tannin; from starch by giving no reaction with iodine; and from dextrin, gum arabic, gum tragacanth, and pectin, by its insolubility in dilute alcohol and in dilute mineral acids. Carefully purified, it was found to contain after deducting the carbonate of sodium, in 100 parts, carbon, 44.39, hydrogen, 5.47, nitrogen, 3.77, and oxygen, 46.37 parts.

Algin has properties which should make it useful for several applications in the soluble form. As a stiffener of fabrics, either bleached or unbleached (for dark goods), it has some advantages over starch, with which, as well as with dextrine, it mixes very well. It may, moreover, be rendered insoluble by passing the fabric through an acid bath, and may thus serve as a vegetable mordaunt for dyeing; or it may be rendered insoluble by salts of calcium, barium, etc. On account of its nitrogenous character, it may be also of some value as a food material, particularly for cattle.—Phar Jour. Trans., June 9, and 16, 1883, 1019–1022 and 1037–1039.

Cane Sugar—Oxidation by Chromic Acid.—Dr. Carl Heyer has studied the effect of chromic acid upon cane sugar, and ascertained the products of oxidation to be formic acid, oxalic acid, and carbonic anhydride. The formation of oxalic acid had been overlooked by previous investigators, probably because chromic oxalate forms soluble double salts with calcium chloride, as well as with ammonia. The result of the action of 8 equiv. CrO_3 upon 1 equiv. $C_{12}H_{22}O_{11}$ was: $2CO_2 + 2CH_2O_2 + 2C_2H_2O_4$. The same amount of sugar yielded with 12 equiv. CrO_3: $4CO_2 + 4CH_2O_2 + 2C_2H_2O_4$; while with 16 equiv. CrO_3 only carbonic anhydride was formed $= 12CO_2 + 11H_2O$.—Arch. d. Phar., May 1882, p. 336–350, in Am. Jour. Phar., Aug. 1882, 408.

Cane Sugar—Oxidation of Potassium Permanganate.—Maumené reported (1872) having obtained two new acids, hexepinic and trigenic acids, among the products of the reaction between the two compounds. Dr. C. Heyer, however, found the supposed hexepinic acid to be merely oxalic acid, and the trigenic acid to be a syrupy liquid containing free acetic and formic acid and potassium salt. The results of oxidation are the same as with chromic acid, carbonic anhydride, oxalic acid and formic acid. Oxalic acid is produced only in very dilute solutions and at the ordinary temperature; in the presence of free sulphuric acid only carbonic anhydride and formic acid are produced, and with a sufficient amount of permanganate the sugar is completely oxidized to carbonic anhydride and water.—Ibid.

Sugar from Maize.—An interesting paper on the development of the manufacture of sugar from maize, by Mr. R. H. Harland, is reprinted from "The Analyst" (Sept. 1882), in New Rem., Nov. 1882, 332–333.

Pure Grape Sugar—Preparation.—In consequence of a recently published paper by Soxhlet, in which the latter criticises some previous publications on the estimation of grape-sugar by means of Fehling's and Knapp's reagents, and incidentally treats of the preparation of pure grape-sugar, Mr. Jac. G. Otto, assistant at the physiological institute of Christiania, has published the results of some investigations on this subject, conducted by Professor Worm Müller and himself, from which the following is an abstract.

The best method for preparing grape-sugar is the inversion of cane-sugar with hydrochloric acid in alcoholic solution. This was first proposed by Schwarz, and was afterwards further improved by Neubauer. In order to study the method fully, and to ascertain the most favorable conditions for its successful execution, the author made several experiments, differing only in the quantity of hydrochloric acid used. Powdered cane-sugar was gradually, and under constant shaking, added to 600 cubic centimeters of 80 per cent. alcohol and 20 (30 and 40 cc., respectively) of fuming hydrochloric acid, until the liquids assumed a yellow tint. During the experiments, the solutions were kept at a temperature of 25° C. (77° F.) The object being to ascertain the conditions under which the *purest* product would be obtained, no attempt was made to saturate the solutions.

The solutions thus obtained were then filtered through filters, moistened with alcohol, into dry, clean, glass flasks, set aside on November 11, 1880 (two days after the solution had been prepared), to crystallize, and afterwards examined daily. On November 17th, the first crystals of grape-sugar made their appearance in No. 1 (containing 20 per cent. HCl), on November 19th in No. 2, and on November 27th in No. 3. The further deposition proceeded rapidly in No. 1, somewhat slower in No. 2, and was quite feeble in No. 3. On January 10, 1881, when none of the samples seemed to increase any further, the supernatant liquid was poured off as much as possible, and the white crystalline precipitate mixed with 90 per cent. alcohol. On the next day the crust in the bottom of the flask was crushed and transferred to a rapid filter. After the liquid had been removed, the residue was rubbed to powder in presence of absolute alcohol, allowed to stand until the following day, then again transferred to the rapid filter, and this process repeated until the washings no longer showed an acid reaction, and a concentrated aqueous solution of the sugar, acidulated with nitric acid, ceased to produce a precipitate with nitrate of silver. The grape-sugar was then dried in a vacuum, and afterwards, for about twenty-four hours, at a temperature of 40° C. (104° F.), over concentrated sulphuric acid, or over chloride of calcium. Thus obtained, the yield of grape-sugar and the quantity of absolute alcohol used for complete washing were respectively:

No. 1	30 gm. grape-sugar,—	260 cc. alcohol
No. 2	19 " "	320 "
No. 3	11 " "	330 "

Both in yield, therefore, and in saving of alcohol, experiment No. 1 turned out to be the most advantageous. This result appears to be contradictory to previous investigations, in which 30 to 40 cc. of hydrochloric acid (per 600 cc. of alcohol), usually gave a larger yield; but the difference may arise from the fact that the author's experiments were performed at a rather higher (by 5° to 10° C.) temperature.

All the products obtained above were snow-white: when melted with 20 per cent of water they were perfectly colorless, even in thicker layers, and were found to have the same melting point, after drying at 100° C., viz., 146° C.

The author mentions some special precautions which must be observed in drying the sugar. If the latter, after being dried at 40° C. (as directed above), were at once put into a water-bath of 100° C., it would often (though not always) occur that a portion of the sugar would melt, in consequence of the excess of water it contains, and thereby become unsuited for further use. It is, therefore, necessary to gradually raise the temperature from about 40° C. (104° F.) to 100° C. (212° F.) which consumes a comparatively long time, when larger quantities are under preparation. The author is in the habit of transferring the sugar from the filter-pump into a temperature of 25° to 30° C., and then gradually to raise the temperature.

By completely saturating a mixture of 600 cc. of 80 per cent. alcohol and 20 cc. of fuming hydrochloric acid with cane-sugar (of which usually 300 gm. are taken up), at a temperature of 25° C. (77° F.) during three or four weeks, a yield of nearly 50 per cent. of the original cane sagar was obtained.

It next became necessary to ascertain whether the product thus obtained was perfectly pure, or whether it required to be recrystallized; and, if so, whether absolute alcohol (proposed by Schwarz) was the best menstruum, or methyl alcohol (proposed by Soxhlet).

While the above method of preparation may be objected to, on the score of tediousness, that recommended by Soxhlet leads more rapidly to the desired end. But the resulting product—as Soxhlet himself acknowledges—is not pure, and requires recrystallization. On the other hand, it will be seen that the product obtained by the above-described process is so pure that it does not require recrystallization.

If the sugar needs to be recrystallized it is first boiled, under an upright condenser, for five to ten minutes, with a somewhat smaller quantity of absolute alcohol than is necessary for its complete solution. The solution is next filtered through a hot filtering apparatus (kept at 100° C.) into a flask which is closed with a cork, and at once placed under a stream of cold water. After a few minutes, generally, the crystalline sugar begins to separate, without the preliminary formation of a syrup (which Soxhlet experienced). When quite cooled off, the flask is exposed for twenty-four hours in a cold place, after which the separated sugar is removed by means of a glass-rod to a rapid filter, washed with a little absolute alcohol, and then dried, first over concentrated sulphuric acid in vacuo, and afterwards, for a short time, in an air-bath, the temperature of which is gradually raised from 50° to 100° C.

Or, the sugar may be boiled for five or ten minutes with an amount of methyl alcohol (sp. gr. 0.810 at 20°, and specially redistilled) insufficient to dissolve it. On cooling the flask with cold water, crystallization begins at once. The crystallized sugar, in this case, is more bulky than that obtained with absolute alcohol, and is more easily removed from the flask.

The three kinds of sugar, that obtained by the author's first-mentioned process (which was not recrystallized), and the two kinds recrystallized from ethylic or methylic alcohol, were found to have the same chemical properties, melting point, polarization, and other physical properties.—New Rem., March 1883, 82, from Journ. f. prakt. Chem., 26, 87.

Saccharin—Formation from Invert Sugar.—Mr. H. Kiliani obtained among the products of the action of hydrate of lime on invert sugar, a substance identical in melting point, rotatory power, and composition, with saccharin. By the oxidation of saccharin with oxide of silver, acetic and glycollic acids are formed; it thus differs from dextrose and lævulose, which give oxalic, formic, and glycollic acids. From this result, it would appear that saccharin contains a methyl group, a view which is further confirmed by the fact that by the oxidation of saccharin by permanganate, not only carbolic acid and water, but also acetic acid are formed.—Jour. Chem. Soc., Aug. 1882, 820, from Ber. d. Deutsch Chem. Ges., 15, 701.

Milk Sugar—Preparation.—Messrs. W. Engling and E. Rüf observe, that according to the present modes of obtaining milk sugar, a considerable loss is occasioned by the conversion of part of the sugar into uncrystallizable lactose. This change is occasioned by the presence of free lactic acid and phosphate of potassium in the whey, and it may be avoided by adding 50 to 100 grams of chalk to every 100 litres of the whey, and evaporating the whole to one-half its original bulk: the phosphates, etc., then sink to the bottom, and the supernatant liquor, on further evaporation, yields fairly pure sugar. Cold may also be employed, which by forming ice leaves a strong solution of sugar. It is also advisable, because of the higher value of pure milk sugar, to refine it, which is accomplished by adding sulphate of alumina and chalk. The precipitate formed removes all coloring matter.—Jour. Chem. Soc., Sept. 1882, 1014, from Bieder. Centr., 1882, 346.

ORGANIC ACIDS.

Organic Acids—Detection in Phenol (Carbolic Acid).—Mr. W. Bachmeier communicates a new method for detecting organic acids, which method appears to be generally applicable also to the distinction of inorganic from (most or all?) organic acids.

While the usual inorganic concentrated acids, even fuming nitric acid, discharge the color of an aqueous infusion of sapan or log-wood at once, on the addition of the first drop, but reproduce the color after having been added in larger quantity, the organic acids differ from the former in not being able to revive the color after it has once disappeared. Carbolic acid, however, or rather phenol (it being really an alcohol and not an acid) does not follow the example of organic acids, since it causes but a slight modification of the red color. The author has tried acetic, oxalic, malic, tartaric, citric, succinic, uric, benzoic, hippuric, salicylic, and tannic acids, and finds them all to extinguish the color of the dye-solution permanently. He also finds that the reaction is quite delicate.

An aqueous infusion of sapan or logwood, therefore, is a good reagent to show the absence, in phenol, of organic acids, or to distinguish phenol and salicylic acid (when other acids are absent).—New Rem., Jan. 1883, 18, from Zeitschr. f. Anal. Chem., 1882, 548.

Oxalic Acid—Decomposition by Aqua Regia.—Mr. A. Longi describes a number of experiments showing that oxalic acid is partially decomposed by aqua regia, though not with great facility. In the analysis of compounds or mixtures containing oxalic acid, the estimation of that acid should therefore be made on a separate portion of the original substance. —Jour. Chem. Soc., July 1882, 715, from Gazz. Chim. Ital.

Oxalic Acid—Manufacture by Synthetical Methods.—The synthetical preparation of formic acid—from carbonic oxide and caustic soda or potassa—and the circumstance that the formates of potassium and sodium, as shown by V. Merz and W. Writh, may be converted into oxalates by energetically heating, had led these latter two chemists to propose this method for the manufacture of oxalic acid on the large scale. Experiments have shown that the formate of sodium yields the largest product, if it is heated energetically to a temperature somewhat over 400° C., air being excluded as much as possible. The residue then consists of seventy or more per cent. of oxalate, the rest being carbonate. If the temperature is lower, say about 360° C., more carbonate than oxalate results. Formate of potassium also yields oxalate when heated over 400° C., but only carbonate at 360° C. The formates of calcium, barium, and magnesium yield only carbonate at any temperature.—New Rem., Oct. 1882, 296, from Ber. d. Deutsch. Chem. Ges., 1882, 1507.

Oxalic Acid.—Use as a reducing ageat for *Arsenic Acid*, which see under "Inorganic Chemistry."

Oxalic Acid.—Use for the Detection of *Urea*, which see under "Alkaloids."

Vinegar—Gurjun Oil a Test for the Presence of Mineral Acids.—Mr. Armand Jorissen draws attention to a new test for the presence of mineral acids in vinegar, which is based on the observation of Fluckiger that gurjun oil produces a red coloration, changing to purple, on addition of concentrated mineral acid. Mr. Jorissen found that this reaction could be produced without *concentrated* mineral acids, in the following manner: Into a dry test-tube or introduce one drop of gurjun oil and twenty-five drops of glacial acetic acid; the last named substance does not color gurjun oil; but if to the mixture a single drop of a very dilute mineral acid is added (e. g. sulphuric acid 5:100), and four to six drops of acetic acid are mixed in to render the liquor more transparent, the liquid immediately acquires a pink color, slowly becoming deeper, and finally turning to purple. On adding thirty drops of alcohol the color is not altered, and the mixture has the appearance of a dilute solution of permanganate of potassium. True *oil of copaiba* affords under the same conditions only a very light pink coloration, destroyed by the addition of thirty drops of alcohol. Experiments made show that where vinegar, containing free mineral acids, or chloride of sodium to the amount of 2 per cent. is added to the above test solution, the purple color is developed; whilst vinegar free from mineral acids, or containing only 1 per cent. of chloride of sodium, 1 per cent. of tartaric acid, 1 per cent. of oxalic acid, or saturated with cream of tartar or sulphate of lime, does not produce the re-action. The manipulation is simple, rapid, and easy, and the quantity of material necessary for the test, very minute. It is a necessary condition, of course, that the acetic acid used for making the test solution be absolutely free from mineral acids.—Drug. Circ., July 1882, 100, from Schweiz. Wochenschr. f. Pharm.

Acetate of Lime—Assay of the Crude Salt.—Messrs. Stillwell and Gladding have read an interesting paper on the subject of acetate of lime before the American Chemical Society. The methods of analysis employed are either based upon the amount of soluble lime salts present or upon the distillation of the acetic acid. The objection to the first lies in the circumstance that crude acetate of lime contains other soluble lime salts as well as caustic lime, the presence of which interferes with the accuracy of the method. In the methods of distillation, three acids—hydrochloric, sulphuric and phosphoric—have been in use. The experience of the authors shows the last named, phosphoric, to be the best acid for the following reasons:

First. It does not act on the organic matter.

Second. During the distillation the liquid in the retort is not suffered to fall below 15 cc. in bulk. Under such circumstances, phosphoric acid does not decompose any chlorides of calcium or sodium which may be present in the acetate, thus requiring no addition of sulphate of silver. Only the merest trace of chlorine is carried over, as shown by experiments made with a sample of acetate containing nearly 5 per cent. of chloride of sodium, and also by trial on a known amount of pure chloride of sodium.

Third. It forms a perfectly clear solution with the acetate of lime. By the use of a large amount of glacial phosphoric acid, at least five times the weight of acetate of lime taken for analysis, the phosphate of lime first formed is redissolved to a clear solution. The distillation proceeds quietly and uniformly without bumping, and the liquid in the retort is easily kept at any desired point. The use of a current of steam is necessary, both for ease of manipulation and accuracy of results.

The process of distillation, if carefully and intelligently done, is very accurate, and the authors strongly recommend it. As indicator for titrating the distillate they use phenol-phthalein—1 gram to 250 cc. of a mixture of equal parts of water and alcohol, and find it far preferable to either litmus or cochineal.—New Rem., Sept., 1882, 259, from Jour. Amer. Chem. Soc., iv. 104.

Acetate of Magnesium—Formation of a Basic Salt.—Mr. W. Kuhl finds that when an aqueous solution of acetate of magnesium is warmed with ignited magnesia, the latter is converted into hydrate, and subsequently dissolves to a great extent to form an alkaline liquid, which is a solution of basic acetate of magnesium. Solutions of this salt possess to a remarkable degree antiseptic, disinfectant, and deodorizing properties, instances of which are mentioned by the author. A thick solution of basic acetate of magnesium, containing hydrated magnesia in suspension, has been introduced into commerce.—Jour. Chem. Soc., Aug. 1883, 825, from Ber. d. Deutsch. Chem Ges., 15, 684–686.

Acetate of Iron—Preparation.—The difficulty of preparing a perfectly pure acetate of iron has been overcome by Mr. B. Reinitzer, by the following method, which depends upon the observation that ferric hydrate, precipitated *cold* by ammonia, and afterwards washed with *hot* water, is readily soluble in hot acetic acid, and that this solution is perfectly free, even from traces of ammonia and chlorine. About 50 or 60 grams of crystallized, chemically pure, ferric chloride were dissolved in cold water, and gradually precipitated by ammonia until the latter was in excess. The precipitate was transferred to a large paper filter and washed with boiling water until the filtrate ceased to give a reaction for chlorine. The ferric hydrate was then warmed with glacial acetic acid (quantity not given.—REP.), in a beaker, on a water-bath. A perfectly clear, blood-red solution resulted, which, contrary to expectation and to the statement of chemical authorities, could be evaporated on the boiling water-bath, without yielding a residue insoluble in water. In the presence of any other salt, and particularly of the acetate of an alkali, the whole of the iron separates at the first boiling, in form of the well-known red-brown flocculent precipitate. Perfect purity of the acetate, therefore, is the condition for stability of solutions of ferric acetate under the influence of heat.—New Rem., Aug. 1882, 234, from Monatshefte d. Chem., through Pharm. Rundschau, No. 16.

Formic Acid.—Preservative action on *Honey*, which see under "Mellita."

Succinic Acid—Preparation from Tartaric Acid by Fermentation.—In a previous communication, F. König pointed out that succinic acid is the chief product of the fermentation of tartrate of ammonium under the influence of putrefaction bacteria. The author now gives the following process as producing the best yield (20%): 2 kilos of tartaric acid are dissolved in water, neutralized with ammonia, made up to 40 litres, and solutions of 20 grams of phosphate of potassium, 10 grams of sulphate of magnesium, and a few grams of chloride of calcium are added; this mixture with 20 cc. of fermenting tartrate of ammonium solution, is left at 25°–30° for 6–8 weeks until all the tartaric acid is gone. The liquid is evaporated to drive off the carbonate of ammonium, clarified with albumen, rendered alkaline with lime, boiled, and the succinate of calcium decomposed with sulphuric acid. The succinic acid thus obtained is purified in the usual way.—Jour. Chem. Soc., July 1882, 715, from Ber. d. Deutsch. Chem. Ges., 15, 172–173.

Lactic Acid—Manufacture from Corn Meal.—Mr. Chas. E. Avery, after reviewing the history and sources of lactic acid, communicates the following method for its manufacture from corn meal—a very inferior, soured, or otherwise damaged article answering very well. The process resolves itself into three portions: 1st, manufacture of solution for fermentation; 2d., the fermentation; 3d., the purification. 80 to 160 pounds of oil of vitriol are mixed with 2,000 pounds of cold water, and 2,000 pounds of ground maize are stirred into the diluted acid. The mixture is allowed to stand over night, and next morning 2,000 pounds of boiling water are added in portions. After boiling until the tests of conversion into glucose are satisfactory, the hot mixture is run into a fermenting tank, and neutralized with 1,000 pounds (a large excess) of carbonate of lime, followed by 4,000 pounds of cold water, and a variable amount of lactic ferment—one or two per cent. answering well. In a day's time the most vigorous action ensues, and in three or four days' time, with good lactic yeast, the mass sets into crystals of lactate of lime, resembling thick mortar. The lactate of lime is then dissolved in hot water, filtered, crystallized, pressed, and the acid is purified as in other processes, with two exceptions, however; animal charcoal being used to remove color and odor, and after acidulation, distilling off any butyric acid that may have formed. From corn containing 70 per cent. of starch the author has obtained 82 to 85 per cent. of neutral lactate. He calculates the cost of material for 1 pound of lactic acid at 4¼ cents.—New Rem., Aug. 1882, 235, from Proc. Soc. of Arts, Boston.

Benzoic Acid—Permanganate Test.—The following is supplementary to the interesting article on "benzoic acid" abstracted for last year's report (see Proceedings 1882, 380–384). Gehe & Co., have observed that benzoic acid sublimed from benzoin, when dissolved in not perfectly pure acetic acid and reprecipitated by water, would respond to Schacht's test for benzoic acid from Siam benzoin. They have further observed that benzoic acid sublimed from Siam benzoin at a temperature not exceeding 125° C. is white, and when tested according to the new German Pharmacopœia, with potassium permanganate, will after 8 hours show a brown color, the same as benzoic acid prepared from Palambang benzoin, urine or toluol. O. Schlickum has made similar observations. The first portion of benzoic acid obtained by sublimation, was white and remained white, and did not affect the test; the acid subsequently obtained was yellowish and reduced the permanganate, which action, however, gradually diminished in consequence of the resinification of the empyreumatic oil. Benzoic acid containing cinnamic acid will, of course, reduce permanganate, but will also thereby develop the odor of oil of bitter almonds. —Amer. Jour. Phar., Mar. 1883, 140, from Phar. Zeitung, 1882, pp. 617, 780, and 792.

Benzoic Acid—Reaction with Permanganate of Potassium (*Test of the Pharm. Germ.*)—Mr. Carl Lenken has subjected a number of samples of benzoic acid to the permanganate test of the Pharm. Germ., with the results given in the table. This test requires that 0.1 of the acid, dissolved in 5 cc. of boiling water, and allowed to cool, when treated with 16 drops of a half per cent. solution of permanganate of potassium, shall form a colorless liquid after standing 8 hours. The experiments were made under identical conditions, and the drops of solution of permanganate, were measured from a burette, 20 drops having been found to correspond to 1 cc.

A second and third series of experiments consisted in allowing the permanganate to act upon the acid, in acid and in alkaline solution, the acid solution being made by the addition of 16 drops dilute sulphuric acid

Description		Reaction.	
Of the acid.	Of the solution.	Immediate.	After eight hours.
Siam benzoic acid, white.	Neutral.	Violet, turbid.	Liquid yellowish, prp. brown
do do	Acid.	Brown-red.	" colorless, " "
do do	Alkaline.	Green.	" greenish, " "
do yellowish.	Neutral.	Violet, turbid.	" colorless, " white
do do	Acid.	Brownish.	" " " "
do do	Alkaline.	Light green.	" " " brown
Tuluol benz. acid sublimed with $\frac{1}{10}$ Siam resin.	Neutral.	Violet, turbid.	Brown-red.
Tuluol benz. acid sublimed with $\frac{1}{10}$ Siam resin.	Acid.	Brown-red.	"
Tuluol benz. acid sublimed with $\frac{1}{10}$ Siam resin.	Alkaline.	Green.	Liquid green, precip. brown
Sumatra benzoic acid, sublimed	Neutral.	Light brown.	" colorless, " white
do	Acid.	Brownish.	" " " "
do	Alkaline.	Yellowish green.	" " " grey
Benz. acid from cattle urine sublimed with $\frac{1}{10}$ Sumatra benzoin.	Neut'l Acid Alka'n	Like preceding.	
Chem. pure benz. acid from the silver salt.	Neutral.	Violet.	Turbid violet.
Chem. pure benz. acid from the silver salt.	Acid.	Violet.	Violet.
Chem. pure benz. acid from the silver salt.	Alkaline.	Violet.	Dark violet.
Benz. acid from horse urine.	Neutral.	Violet.	Brown-red.
do	Acid.	Violet.	Turbid violet.
do	Alkaline.	Greenish violet.	Dirty green.

(1:4); the alkaline solution by adding 16 drops of solution of sodium hydrate (1 sodium hydrate, purified by alcohol, to 4 p. water). The water, acid and alkali were determined to be absolutely free from oxidizable impurities.

The author furthermore found that all commercial samples of benzoic acid, designated as benzoic acid from cattle urine, toluol-benzoic acid, and acid. benzoicum e gummi sublimatum, produced reactions identical with the last two sorts. Also, that *cinnamic acid* and *vanillin*, under the above test, produced colorless solutions and white precipitates.

It will be noticed that the only acids which responded accurately to the test of the Phar. Germ. are the *yellowish* acid sublimed from Siam benzoin, the Sumatra benzoic acid, and the acid from cattle urine sublimed with Sumatra benzoin. The pure *white* acid from Siam benzoin, and the others, do not respond to the test. Other substances will cause a response to the test, which must be regarded unreliable. Thus a few per cent. of sugar, added to toluol-benzoic acid, will cause it to respond to the test. The author has, however, determined that sublimed benzoic acid from Siam benzoin may be unmistakably determined by the following test: 0.1 of the benzoic acid when shaken with 16 drops of aqueous soda solution (1:4) should form a clear yellow to brownish solution; on the addition of 16 drops of a 0.5 per cent. permanganate of potassiun solution, no direct odor of bitter almond should be developed; after 8 hours the mixture should show a clear yellowish to greenish supernatant liquid and a greyish white to brownish deposit. Of 10 commercial samples thus examined, not a single one responded either to this test, or to the test of the Pharm. Germ.—Arch. d. Pharm., July 1882, 518–524.

Benzoic Acid—Preparation from *Toluene*, which see under *Hydrocarbons*.

Benzoic, *Cinnamic* and *Salicylic Acids*.—Formation of soluble double salts with *Caffeine*, which see under "Alkaloids."

Salicylic Acid—Behavior in Aqueous Solutions.—According to W. Alexejeff, solutions of salicylic acid are obtained by heating the acid with water in closed tubes slightly above 100°. When they are cooled quickly, the whole becomes a crystalline magma, but when they are cooled slowly, peculiar results are obtained, the acid separating sometimes as an oil and sometimes in crystals. A few examples of these results are given: Solutions containing 73.01 and 66.71 per cent. of the acid solidify suddenly respectively at 68° and 67°; whilst those containing 61.2, 42.90, to 21.20, or 4.57, become turbid at 76°, 90.5°, or 63°, and deposit the acid as an oil; solutions containing 2.96 per cent. become turbid at 49°, and the acid separates in crystals; solutions made at 12.5° contain 0.16 per cent. of salicylic acid; at 66°, 1.27 per cent.; at 81°, 2.44 per cent.; at 100°, 8.67 per cent. From these facts, the author infers that there are three different kinds of solutions, viz.: 1st. Solutions of water in salicylic acid. 2d. Solutions of the acid in water which deposit, on cooling, the "liquid acid." 3d. Solutions of the acid in water depositing, under similar conditions, crystals of the acid. The "liquid acid," is an example of the first kind, and the supernatant liquid, which is highly refractive, of the second or third; for the same solution may be classed in either one of these, according to the temperature at which it is prepared, inasmuch as all solutions made below 100° contain the "solid acid," whilst those made above 100° contain the "liquid acid."—New Rem., Feb., 1883, 53, from Jour. prakt. Chem.

Salicylic Acid—Detection in Foods.—This is usually accomplished by agitating the substance to be examined with ether, benzol or carbon bisulphide. The method is, however, circumstantial, and is not applicable in the presence of fats. The following simple and reliable method, perfected in the laboratory of the "Chemiker-Zeitung," is based upon the volatility of salicylic acid with aqueous vapor. If a liquid, wine, beer, milk, etc., is to be examined, about 100 cubic centimeters of the same are brought into a flask connected with a Liebig's condenser, and distilled as quickly as possible. A few drops of the distillate are collected from time to time, and tested with pure, neutral ferric chloride; if a violet coloration ensues, salicylic acid is present. From dilute solutions the salicyic acid does not distil so readily as from concentrated. A liquid, *e. g.*, which contained 0·005 per cent. of salicylic acid gave in the first half of the distillate only a very feeble reaction, while two drops of the following portion assumed with ferric chloride an intense violet color. Salicylic acid is not volatile with alcohol vapors, and likewise not in the presence of tannin; in the latter case, and when contained in red wine, it suffices to acidulate with sulphuric acid in order to obtain perceptible amounts of salicylic acid in the distillate.

If non-volatile substances, such as butter, are to be examined a sufficient amount is brought into a flask, an active current of steam led through the mass, and the distillate tested as above. With slight traces of salicylic acid, which are no longer detectable in the distillate by ferric chloride (0.0005 gram dissolved in 100 cubic centimeters of water yields an intense coloration), a large amount of the distillate is slightly supersaturated with ammonia, and evaporated on the water-bath to dryness. The residue is then dissolved in a little water, and tested with ferric chloride; if the violet coloration does not now appear, the absence of salicylic acid is proven.

It is still to be observed that the violet coloration does not appear in the presence of free acids, alkalies, or large amounts of salts.—Amer. Jour. Phar., Sept. 1882, 443, from Chem. Zeitung, No. 32, 1882, p. 619.

Salicylate af Sodium—Preparation of a Stable Solution.—Mr. John C. Martin having found that solutions of salicylale of sodium, no matter by whom the salt may have been manufactured, turn dark soon after their preparation, the color gradually increasing to a deep purple or black, recommends the following stock solution: Salicylic acid, 16 ounces; hyposulphite of sodium, 1 drachm; bicarbonate of sodium, 9 ounces; boiling water, sufficient. Rub the salicylic acid into a paste in a large mortar, with one pint of hot water, and add the hyposulphite. Dissolve the bicarbonate of sodium in one and one-half pints of boiling water, and add it gradually to the first mixture. Filter through white paper, and add sufficient water to make the whole measure four pints. The product has a pale straw color. Glycerin may be used in place of a portion of the water, if desired. The addition of a few crystals of hyposulphite of sodium will decolorize solutions of salicylate of sodium that have darkened. —New Rem., May, 1883, 135, from Drug. Circ.

Salicylate of Sodium—Detection in Milk.—Which see under "Albuminoids."

Salicylate of Zinc—Preparation, etc.—Messrs. Poignet and Demarres assert that salicylate of zinc is preferable to the sulphate as an astringent in ophthalmic affections, and in other cases, since it combines with its astringent action the antiseptic properlies of salicylic acid. It is prepared by acting upon hydrated oxide of zinc by means of salicylic acid in presence of water; the two substances digested at a moderate temperature, and the solution filtered. The filtered solution is submitted to evaporation, and then allowed to stand in a cool place, when the salicylate of zinc soon crystallizes in fine white needles of considerable length. These crystals have first a sweetish taste, but this is soon followed by a stypic and bitter sensation on the palate. The salt is very soluble in water, and dissolves also in alcohol and ether. The medical properties attributed to salicylate of zinc, are that it forms a valuable antiseptic and astringent agent. In certain kinds of cancerous ulcers, it has given some excellent results, and has been used successfully in gonorrhœa, as an injection, in solution containing one-half to one per cent of the salt.—New Rem., May 1883, 143, from Monthly Mag. of Pharm.

Citric Acid.—Percentage found in *Lime Juice*, which see under "Materia Medica."

Lithium Citrate—Characters, etc.—Mr. C. Thompson reviews the history of this compound, and particularly its characters as given in the U. S. and Br. Pharmacopœia. Referring to Mr. Umney's paper (see Proceedings 1876, 331–332), in which it was already shown that both Pharmacopœias gave unsatisfactory processes, he points out that at the present time there exists no necessity for an indefinite compound, such as is produced by either of these processes, since manufacturers can now readily furnish lithium citrate in crystals, non-deliquescent, definite and reliable. —Phar. Jour. Trans., March 24, 1883, 783–786.

Ferrous Citrate—Formation of Double Salts.—R. Rother communicates the following methods of making ferrous citrate and some of its double salts:

Ferrous Citrate is best prepared by heating for about three hours, or until reaction ceases, 56 parts of very fine iron filings with 210 parts of citric acid and a nearly constant 1,500 parts of water. As the iron always contains carbon, the quantity will practically have to be about 60 parts. Since the citrate only serves to prepare the soluble forms, any amount of iron in excess is immaterial.

Sodioferrous citrate is prepared by adding to the ferrous citrate of the above process 84 parts of hydrosodic carbonate, heating until effervescence ceases, setting the solution aside till the carbonaceous residue has subsided, decanting the clear liquid, evaporating it to a syrupy consistence, and spreading it on glass or porcelain plates to dry. A definite solution can also be kept on hand.

Sodioferrous citrophosphate is prepared by adding 105 parts of citric acid and 179 parts of sodic phosphate to the product of the preceding process, and proceeding in a similar manner as there directed.—Amer. Jour. Phar., Jan. 1883, 41–45.

Ferric Citrate—Preparation and Formulas of its Double and Secondary Salts.—R. Rother observes that the imperfect formulas given for ferric citrate and its double salts have given rise to erroneous processes and false results. In the case of

Ferric Citrate.—No account is taken of the water. When this salt is heated to constant weight, its complete formula is $Fe\,Ci\,1\frac{1}{2}\,OH_2$. When 136 grains of this compound are treated with ammonia to excess, and evaporated to complete dryness, 158 grains of *diammonio-ferric hydrocitrate* are obtained. This compound has the composition $Fe(NH_4)_2\,Ci\,(OH)_2$.

Dipotassio-ferric Oxycitrate ($Fe\,K_2CiO$), is obtained when 136 grains of ferric citrate and 56 grains of potassic hydrate are dissolved and evaporated to dryness. The yield is 168 grains.

Sodio-ferric Hydrocitrate ($Fe\,Na\,Ci\,(OH)$) is obtained when 272 grains of ferric citrate and 84 grains of hydrosodic carbonate are used; the yield is 285 grains of an elegantly scaled and very light-red non-deliquescent compound.

Sodio-ferric Citrocarbonate ($Fe\,Na_2\,Ci\,CO_3$), is produced when two equivalents of the sodium carbonates are used, and when three equivalents are used

Sodio-ferric Hydro-citrocarbonate ($Fe\,Na_3\,Ci\,CO_3\,(OH)$) is produced. This latter forms a blistered, scaly, very soluble mass.

The author, furthermore, describes some compounds of ferric citrate with normal citrates, which unites molecule for molecule. Among these, $Fe\,K_3\,Ci_2$, $Fe\,Na_3, 3\,(OH_2)$, and $Fe\,(Qu\,H)_3\,Ci_2$.—Amer. Jour. Phar., Mar., 1883, 116–119.

Trihydrous Sodioferric Citrophosphate—Preparation.—Mr. R. Rother, after giving the result of his studies on *ferric citro-phosphate* and *citro-pyrophosphate* and their double salts, observes that the pyrophosphates in general are superfluous and comparatively valueless, and that they should be discarded in the exclusive favor of the orthophosphates. He also advises that instead of scaling them, pharmacists should simply evaporate and dry them, at a moderate heat, in large, shallow capsules. The author particularly recommends the trihydrous sodioferric citrophosphate which can be very easily prepared by the following formula:

Ferric citrate	544 parts.
Disodic phosphate, in transparent crystals	358 "
Hydrosodic carbonate	84 "
Water	1,200 "

Place the ferric citrate, sodio-carbonate and water into a spacious capsule; then apply heat, and when effervescence ceases, add the sodic phosphate; stir until all the salts have dissolved, and evaporate the solution, at a moderate heat, to a syrupy consistence, and spread it on glass plates, to dry the salt in scales.—Amer. Jour. Phar., April 1883, 165–170.

Citric and Tartaric Acids—Laboratory Notes.—The following notes from the laboratory note-books of the late Mr. B. J. Grosjean have been compiled, and are communicated by Mr. Warrington to the Chemical Society of London:

1. "*On the Different Rates of Loss of Different Specimens of Citric Acid in Dry Air.*" Three specimens of different samples of citric acid were powdered and placed in two desiccators over fresh oil of vitriol on April 21st, 1880. On May 6th, one specimen had lost 0.68 per cent.; the second, 6.25 per cent.; the third, 8.55 per cent. On May 15th, the first had lost 1.75 per cent.; the second, 8.55; and on June 26th, the first specimen had lost 8.47 per cent. The theoretical amount of moisture present was 8.57 per cent.

2. "*Determination of Citric Acid in Lemon and Other Juices.*" The method used by precipitation, with chloride of calcium, etc., has already been described (Chem. Soc. Journ., 1875, 931). It appears that the precipitable acid in commercial concentrated lemon-juice is, on the average, very nearly equal in quantity to the free acid present. Thus, in sixty-five analyses, representing eight hundred and ninety-five pipes, the precipitated acid averages 99.2 per cent. of the free acid; some exceptional samples gave numbers from 85.8 per cent. to 103.6 per cent. In bergamot juice, the average number from ninety pipes was 98.4 per cent.; in lime juice, 91 to 92 per cent.; in orange juice, about 68.5 per cent. of the free acid was found to be precipitable. Thus, while the determination of the free acid gives trustworthy results with lemon juice, it furnishes with lime and orange juice a very unsafe guide to the quantity of citric acid present.

3. "*Influence of Heat on Solutions of Tartaric Acid.*" Forty grams of tartaric acid were dissolved in water and concentrated till a crust formed. The acidity was now reduced to 97.9 per cent. of the original acid, while the ortho-tartaric acid, precipitated by potassium citrate, was only 74.6 per cent. On diluting and boiling for two hours, the solution gave 99.9 per cent. ortho-tartaric acid. The meta-tartaric, formed as above, is also slowly reconverted into ortho-tartaric acid by standing in dilute solution at the ordinary temperature. Thus the percentage of ortho-tartaric acid in the above solution increased after standing two months from 74.6 to 90.

4. "*Influence of Sulphuric Acid on the Crystallization of Tartaric Acid.*" Sulphuric acid considerably diminishes the solubility of tartaric acid. Much more tartaric acid crystallizes out from a saturated solution in dilute sulphuric acid than from a hot aqueous solution ; the latter deposits only 50 per cent. of its tartaric acid on cooling, whilst a hot solution in one volume of water and one and a half volumes of oil of vitriol deposits 70 per cent. of its tartaric acid.

5. "*Actions of Solutions of Potassium and Sodium Sulphates on Calcium Tartrate.*" In the ordinary manufacture of tartaric acid, moist gypsum is added to decomposed neutral tartrate of potash and precipitate calcium tartrate. Under certain conditions this reaction is reversed, and if the solutions of potassium or sodium sulphate be sufficiently strong, practically the whole of the tartaric acid in calcium tartrate may be brought into solution as potassium or sodium tartrate.

6 and 8 are omitted, being only titles.

8. "*Determination of Free Sulphuric Acid in Tartaric Acid Liquors.*" To ascertain when enough sulphuric acid has been added to decompose the calcium tartrate, the workman usually adds a few drops of calcium chloride solution. If a precipitate appears in a few minutes, free sulphuric acid is present. It is proved in the present paper that this test, with certain precautions as to time and dilution, may be used quantitatively.

9. "*Determination of Tartaric Acid by Precipitation as Acid Potassium Tartrate.*" The ordinary method consists in the precipitation of tartaric acid with an excess of potassium citrate, washing the precipitated bi-tartrate with a five per cent. solution of potassium chloride saturated with bi-tartrate, and determining by titration the acidity of the precipitate. This method is subject to two errors, one of excess due to the precipitation of an acid citrate. The author concludes that in all accurate determinations it is necessary to make preliminary experiments with graduated quantities of potassium citrate to discover the proportion which gave a precipitate of maximum acidity. This being ascertained, a final determination was made with this quantity, the precipitate thoroughly

washed, and its acidity determined. If much sulphuric acid is present, the result is usually about 1 per cent. in excess of the truth.

10. "*Detection of Tartaric Acid in the Presence of Citric Acid.*" Cailletet's bichromate test (Chem. Soc. Journ., abstracts, 1879, 674) [United States Pharmacopœia, 1882, p. 13, under Acidum Citricum, ED. NEW REM.] gives satisfactory results.

11. "*Determination of Organic Acids from Neutralizing Capacity of the Ash of the Salts.*" With potassium or sodium salts the ignition must be effected by a spirit lamp, *i. e.*, at a low temperature, to avoid loss.

12. "*Standardizing of Alkali used in Titrations.*" The best material for this purpose is acid potassium tartrate: it is easily prepared pure, can be dried at 100°, is not hygroscopic, and being of low acidity, a large weight can be taken.—New Rem., Feb. 1883, 47, from Chem. News, 1882, Nov. 24.

Citric and Tartaric Acids—Separation.—According to C. Rovera, the solution of the mixture of both acids is neutralized with sodium carbonate, the carbonic acid expelled by boiling, and the solution subsequently made slightly but perceptibly acid by the addition of a very small amount of the respective acid mixture. A solution of calcium chloride is then added, whereby the tartaric acid is completely separated, and from the filtrate the citric acid is separated as calcium citrate when the liquid is heated to boiling.—Amer. Jour. Phar., May 1883, 264, from Giorn. Farm. Chim., 32, 60, through Chem. Ztg. No. 26, 1883, 393.

Ferric Tartaro—Aloetate—A New Scaled Preparation.—Mr. Carlo Pavesi describes a preparation which he names as above, and which he asserts to be free from bitterness and inky taste, as well as highly soluble. It is prepared by mixing 2 parts of powdered socotrine aloes, 1 part tartaric acid, 1 part recently prepared hydrated ferric oxide, and ½ part of fine iron filings, with sufficient water, in a porcelain vessel, to form a thin paste, and after heating this at a temperature of 50° or 60°C. for 15 minutes, setting it aside for five or six days; then add small quantities of water, taking care to stir up the mass after each addition. Filter through paper, and dry the clear yellowish-brown liquid at a low heat on large slabs. The preparation must be kept in well-stoppered bottles.—Drug. Circ., Sept. 1882, 130, fron L'Imparziale.

Tartrate of Bismuth.—Use for Hair Dye, which see under "Pharmacy."

Gelsemic Acid—Supposed Identity with Æsculin.—Dr. Edward Schwartz has experimented with the two important principles of *Gelsemium sempervirens*, gelsemine and gelsemic acid, with the view of their forensic-chemical determination. Gelsemic acid was obtained by the method recommended by Dragendorff ("Jahresbericht für Pharmacie," 1878, p. 640) from the acidulated solution by agitation with chloroform.

The chloroform solution, on evaporation, left a crystalline residue, which dissolved partly in water, with a yellow color, and showed a strong blue fluorescence. The small insoluble portion was dissolved in alcohol. Both solutions, placed over sulphuric acid, yielded crystals; those from the watery liquid were light yellow-brown fine needles, being-comb-like, attached to a larger prismatic crystal. These crystals showed all the reactions of æsculin, except that they acquired a greenish color with ferric chloride, due probably to the presence of æsculetin. The crystals from the alcoholic solution emanated from a central point, and were branching in a tree-like manner; in the deeper part of the vessel several thorn-apple-like aggregations of crystals were observed. The amount obtained was so small that no accurate investigations could be made in this instance.—Amer. Jour. Phar., Aug. 1882, 389–394.

Gelsemic Acid—Distinction from Æsculin.—In a former paper (1870) Dr. Theodore G. Wormley had announced that *Gelsemium Sempervirens* contained, besides an alkaloid, *gelsemine*, a non-nitrogenized acid principle, which he named *gelsemic acid.* Subsequently, Professor Sonnenschein and Mr. Charles Robbins (see Proceedings 1877, 135) concluded that the so-called gelsemic acid was identical with the glucoside *æsculin*, found in the bark of the horse-chestnut, etc. Dr. Wormley has now again gone over the ground, and having carefully prepared the acid non-nitrogenized principle previously obtained and described by him, and subjected it to comparative examination along with a sample of æsculin prepared by Merck, of Darmstadt, he pronounces his principle, for which he retains the name "gelsemic acid" provisionally, to be distinct from æsculin. The gelsemic acid crystallizes readily, whereas æsculin does so with difficulty; it is much less soluble in water than æsculin, but dissolves much more readily in ether. Sulphuric acid dissolves gelsemic acid with a yellowish color, which is not changed by warming in a water oven; whilst æsculin under the same conditions quickly becomes brownish and charred. Hydrochloric acid dissolves æsculin readily, but does not act upon gelsemic acid. The reactions of the two substances with nitrate of silver, corrosive sublimate, bromine in bromhydric acid, sulphate of copper, and neutral acetate of lead, are also distinctive, as are also their physiological effects.—Amer Jour. Phar., July, 1882, 337–342.

Aconitates.—E. Guinochet has prepared and describes a large number of aconitates, which, as a rule, readily form supersaturated solutions, and their solutions when boiled frequently yield a precipitate, which redissolves more or less completely on cooling. Besides the *mono*, *bi*, and *tri*-basic aconitates of the alkalies and of the alkaline earths, compounds of aconitic acid with cobalt, nickel, cadmium and zinc are described.—Jour. Chem. Soc., July, 1882, 717–718, from Compt. Rend., 94, 455–457.

Eriodictyonic Acid.—Proposed compound with quinine. See *Quinine Eriodictyonate* under "Organic Chemistry."

Chrysarobin—Precautions in the External Use.—Chrysarobin (or commonly, though improperly, called chrysophanic acid), which is much used as an effective local application in psoriasis, has the disagreeable property of irritating, or even inflaming the healthy skin when applied to it, and to stain the clothing coming in contact with it. This may be avoided by proceeding as follows:

Mix the chrysarobin with water, so as to form a dough, and carefully apply this to the diseased spot, which has previously been freed, by warm water, from the adhering scales. As soon as it is dry, which will be in a few minutes, cover it with a layer of collodion. The latter forms a tough skin over it, which prevents its spreading beyond the original place of application. After some days the whole may be soaked and washed off with warm water, when the application may be repeated.—New Rem., Jan. 1883, 20, from L'Union Pharm.

Picric Acid—Detection in Beer.—For the detection of picric acid in beer, Mr. G. Christel recommends the following method: 200 ccm. of beer are evaporated on a water-bath to a syrupy consistence; the residue is brought into a small flask, 50 ccm. of alcohol (90 per cent.) are added, the liquid allowed to stand for 24 hours with frequent active agitation, filtered, and the residue treated again with 30 ccm. of alcohol. The mixed filtrates are evaporated to a syrupy consistence, to the residue 4–5 drops of dilute sulphuric acid (1:3) are added, and to the mixture, contained in a test-tube, which may be closed with a cork, 5 to 6 times its volume of ether is added. The mixture is actively agitated, the ether decanted, and the operation repeated with a fresh portion of ether, and the addition of 2 or 3 drops dilute H_2SO_4. The mixed etherial solutions are allowed to evaporate, the residue diluted with water to the measure of 5–10 ccm., filtered, and neutralized with ammonia water. In this solution the picric acid may be detected by the known methods; a very delicate reagent for it is potassium cyanide. 0.2 gm. of powdered sugar with which 0.0001 gm. of picric acid was mixed, afforded a fine rose-red color on the addition of one drop of solution of potassium cyanide.—Amer. Jour. Phar., June 1883, 299, from Arch. Phar., 21, 190, through Chem. Ztg., 1883.

Uric Acid—Synthetical Preparation.—The first organic body ever produced artificially was *urea*, and one of the latest that has been formed synthetically is uric acid, also a constituent of the urine, but of much more complex construction. The first was accomplished by the late Prof. Wöhler, the last by John Horbaczewski, in the laboratory of Prof. Ludwig, in Vienna. The operation is thus described by him: Pure and finely pulverized glycocol, obtained from hippuric acid, was mixed with ten times its weight of pure urea made from cyanate of ammonia. The mixture was heated rapidly in a flask on a metal box to 200° or 230° C. (392° to 446° Fahr.). The heating was continued until the fusion, which was at first perfectly colorless, became turbid and thick, and of a yellowish-brown color. When cold, the fused mass was dissolved in dilute caustic potash, the solution was supersaturated with chloride of ammonium, and then precipitated by an ammoniacal silver solution, mixed with magnesia mixture. The precipitate, which contains the uric acid, was well washed with ammonia water, and then decomposed with potassium sulphide. After filtering out the precipitate, the filtrate was saturated with hydrochloric acid, and concentrated by evaporation. The crude product that separated on cooling was again dissolved in dilute potash, and the same process twice repeated. The final product was a yellowish-colored crystalline powder, which was washed with alcohol first, then dried, and the sulphur removed with carbon disulphide, and finally washed with ether. The product purified in this way showed all the properties and reactions of uric acid.

1. Under the microscope, the crystals exhibited the forms and characteristics of uric acid, either plates or whetstone-shaped crystals, according to the purity of the preparation.

2. They reduced alkaline copper solution when heated, and the silver solution without heating.

3. They dissolved in concentrated nitric acid with the evolution of brown vapors, and the onion-red residue left by evaporation (murexide test) turned purple with ammonia, violet with potash.

4. They were very slightly soluble in water, acids, alcohol, and ether; but easily soluble in caustic alkalies.

An elementary analysis gave the following result:

	Calculated.	*Found.*
Carbon	35.72	35.68
Hydrogen	2.38	4.02
Nitrogen	33.33	33.49

The author reserves the privilege of studying more fully the reactions which he communicates.—New Rem., Mar. 1883, 83, from Ber. d. Deutsch. Chem. Ges.

Caffeic Acid—Preparation from Cuprea Bark.—Mr. G. Körner, engaged in researches on cuprea bark, discovered that during the manufacture of sulphate of quinine from the bark there is formed a notable quantity of caffeic acid, which is evidently produced by the breaking up of a complex substance existing in the bark in company with quinine. The caffeic acid is found in the mother liquors, as

Caffeate of Quinine.—This salt is obtained by repeated evaporation and fractional crystallization in slightly colored mammillar crystals, which on being treated with dilute sulphuric acid and exhausted with ether, sometimes give caffeic acid, but at others an acid which is obtained in such small quantities that it has not yet been studied.

The author gives the process for the preparation of the acid from the bark, whereby he obtained about 0.5 per cent. He also gives the characteristics of the acid so obtained, in which it corresponds in all respects with the description of caffeic acid given by Hlasiwetz (Liebig's "Annalen," vol. cxlii.) for the acid obtained by splitting up caffeo-tannic acid. He has, moreover, prepared from the cuprea bark acid some bimethyl caffeic acid and its methylic ether, which both gave precisely the same characteristics as the corresponding compounds prepared from the caffeic acid of Hlasiwetz. The author's observations furnish an additional proof of the relationship which exists between coffee and cinchonaceous plants. With several extracts of other species of cinchona bark, the author could not succeed in obtaining the acid.—Phar. Jour. Trans., Sept. 23, 1882, 246, from "Annali di Chimica."

Tannic Acid—Deodorization.—Mr. J. Heinz, in order to get rid of the peculiar odor which tannin invariably possesses, found it necessary to eliminate the green resinous matter with which it is usually associated, which he accomplished as follows: The tannin is dissolved in twice its own weight of boiling water, and the solution is introduced into a clean flask, where it is allowed to become quite cool. For every six parts of tannin thus dissolved there are added one-half to one part of ordinary ether, and the whole is well shaken together. Under these circumstances the mixture soon becomes greenish-colored and cloudy, and in the course of a few hours the coloring matter is found coagulated, and deposited at the bottom of the flask. The liquor, when filtered, is a limpid and odorless solution of pure tannin.—Drug Circ., Feb. 1883, 21.

Tannin.—Percentage contained in different drugs. See *Astringent Drugs*, under "Materia Medica."

Tannin—Variable Results when Estimated by Löwenthal's Improved Method.—F. Simand had occasion to make a number of tannin estimations according to Löwenthal's improved method, and found that the percentage of tannin in the same material was subject to certain variations, higher results being obtained when a larger quantity of material was boiled out. The analysis is made as follows: 10 cc. of the infusion are treated in a shallow porcelain basin with 1 liter of water and 20 cc. indigo solution. Potassium permanganate is then added slowly drop by drop, until a yellow color with faint reddish tinge is produced. To determine the oxidizable "non-tannin" constituents, the tannin in 50 cc. of the infusion is precipitated with 50 cc. of gelatin solution saturated with salt, and 25 cc. acidulated water. After shaking up and allowing to stand for some time, the mixture is filtered. 25 cc. of the clear filtrate (corresponding to 10 cc. infusion) are then treated with 1 liter of water and 20 cc. indigo solution, and titrated with potassium permanganate. By deducting from the quantity of potassium permanganate used in the direct titration the quantity consumed in the second titration, the number of cubic centimeters required to oxidize the tannic acid in 10 cc. of infusion is obtained. As the volume corresponding to a certain weight of extracted material is known, and the potassium permgananate value of the tannin has been determined previously, it is easy to calculate the percentage of tannin in the tanning materials, provided that in the gelatin filtrate the "non-tannin" bodies only are titrated. This, however, was found not to be the case. The consumption of potassium permanganate in titrating the gelatin filtrate is mainly due to the solubility of the "gelatin tannate" in dilute sulphuric acid. The author is investigating this point with a view of remedying it.—Amer. Jour. Phar., Dec. 1882, 600–602, from Dingl. Polyt. J. 244, 303–411, through Jour. Chem. Soc., Nov. 1882.

Nuphartannic Acid and *Nymphæatannic Acid—Occurrence, Products of Decomposition, etc.*—See *Nymphæaceæ*, under "Materia Medica."

Pyrogallic Acid—Cause and Prevention of Discoloration of the Skin by Topical Application.—Mr. C. Hupier states that the discoloration of the skin observed after the topical application of pyrogallic acid, is due to the oxidizing action of the alkalies in the soap used for washing, and that if the part is simply washed with warm water without soap and wiped with a soft towel, the stain will be much lighter.—New Rem., Nov. 1882, 335, from Rep. de Pharm.

ORGANIC BASES.

A New Alkaloid resembling strychnine in its toxic action has been isolated by Dr. Mathew Hay from *Cannabis Indica*, which see under "Materia Medica."

A New Alkaloid is said to be contained in the bark, etc., of the *Guachamaca tree* (*Apocynaceæ*), which see under "Materia Medica."

New Alkaloid.—Occurrence in *Hymenodictyon Excelsum*, which see under "Materia Medica."

Vegetable Alkaloids—Methods of Separation.—A very interesting lecture on the vegetable alkaloids, and the method of their separation, was read before the North British Branch of the British Pharm. Society, and is reported in Phar. Jour. Trans., March 3 and 17, 1883, pp. 719 and 758.

Alkaloids.—Preparation of the Potassio-bismuthic iodide reagent, which see under "Inorganic Chemistry."

Alkaloids—New Reagents.—R. Palm directs attention to the following re-actions: Sodium sulphantimoniate yields in nearly neutral solutions of alkaloids precipitates consisting of sulphide of alkaloid and antimony; in very dilute solutions the precipitates are at first colorless or milky, but in contact with air change to yellowish: in more concentrated solutions they are at once yellow or red-brown. Most of these precipitates are soluble in excess of the precipitant.

Chloride of lead dissolved in water or in solution of sodium chloride yields with most alkaloidal salts colorless crystalline precipitates. A concentrated solution of sodium chloride precipitates bebeerine, the alkaloid of bebeeru bark, completely as hydrochloride, a behavior which may be useful in the preparation of this alkaloid.—Amer. Jour. Pharm., June 1883, 308, from Chem. Ztg., April 29, 1883; Zeitsch. Anal. Chem.

Alkaloids—New Color Reactions.—Dr. Carl Arnold has determined that when a small particle of an alkaloid is triturated with a few drops of conc. sulphuric acid, heated gently, and then gradually treated with a concentrated (30–40 per cent.) alcoholic or aqueous solution of potassa to excess, characteristic color reactions result either during or at the end of the process, which serve to distinguish them. The author's results are given in an extensive table, both with alcoholic and with aqueous solution of potassa, and they embrace the principal alkaloids. Characteristic reactions are likewise obtained, when previous to the addition of the alkali solution, a few small crystals of nitrate of sodium are rubbed with the mixture of sulphuric acid and alkaloid, and these results are given in a second table.

Furthermore, the author has determined the following reactions of syrupy phosphoric acid (obtained by dissolving acid phosph. glaciale in officinal (Germ. Ph.) phosphoric acid) and coniine, nicotine and aconitine.

Coniine.—When a drop of the alkaloid is mixed with several drops of syrupy phosphoric acid, and is evaporated in a porcelain capsule over a small flame, a handsome blue-green color is produced.

Nicotine, treated in the same manner, gives a deep-yellow to orange-yellow color. The residues, in both cases, are soluble in water with the respective colors. The reaction is best obtained by heating the mixture of acid and alkaloid on a water bath for 5-10 minutes, the coniine reaction being under this condition of a pure green. The well-known violet coloration of *Aconitine* with phosphoric acid is also best obtained in this manner, the heating being prolonged, however, to 10–15 minutes.—Arch. d. Pharm., Aug. 1882, 561–566.

Alkaloids—Potassio-Bismuthous Iodide as a Test.—F. Mangini has experimented with this test, recommended by Dragendroff, and finds that the reagent, when prepared by Dragendorff's method, produces a turbidity even in pure water; but when prepared by mixing 3 parts potassium iodide with 16 parts liquid bismuth iodide and 3 parts hydrochloric acid, it does not give any turbidity with water, and is an extremely delicate test for alkaloids, serving also to distinguish many of them one from the other by the various gradations of color of the precipitates and their alterations after long standing.

The following are the results obtained:

Strychnine.—Light yellow precipitate becoming dark yellow after some time; supernatant liquid remains clear.

Morphine.—Reddish-yellow precipitate which agglomerates at the bottom; liquid remains clear, precipitate disappearing after a few days if the whole is left at rest, and the liquid becoming canary-yellow.

Codeine.—Immediate copious, yellowish-red precipitate, remaining for some time suspended in the liquid, and assuming a light brick-red color when left at rest.

Atropine.—Precipitated at first in filaments, but gradually settling down in the form of a reddish-yellow powder, which if left at rest becomes canary-yellow, and dissolves after some time, coloring the liquid golden-yellow.

Aconitine.—Precipitated at first in flocks, but suddenly forms at the bottom a chrome-yellow pulverulent precipitate, which does not change color when left at rest, whereas the liquid becomes yellow.

Brucine.—Precipitated at first in filaments which ultimately settle down with gold-yellow color, becoming paler when left at rest for some time.

Nicotine.—Immediate red pulverulent precipitate, which suddenly falls to the bottom, and becomes reddish-yellow when left at rest.

Cicutine.—Precipitate similar in character but of darker color, and becoming dirty-white when left at rest.

Solanine.—Slowly precipitated with lemon-yellow color, becoming darker on repose and adhering to the bottom of the tube when shaken.

Veratrine.—Light yellow precipitate forming slowly, remaining suspended for some time, and becoming light canary-yellow when left at rest.

Narceine.—Light yellow precipitate forming slowly and remaining suspended like that of veratrine, but of deeper color: becomes reddish-yellow on repose.

Quinine Sulphate.—Immediate brick-red precipitate which suddenly falls to the bottom, and becomes dirty-yellow on repose; remains suspended after agitation.

Cinchonine Sulphate.—Like the last, but does not fall down so quickly, and acquires a darker color when left at rest.—From Jour. Chem. Soc., 1882; from Gazetta, 1882, p. 155, in Amer. Jour. Phar., Oct. 1882, 490–491.

Morphine—Separation in a Pure State in Forensic Investigation.—Mr. Edmund Scheibe, after alluding to the difficulties of isolating organic poisons from portions of a cadaver, articles of food, etc., communicates the following method for the separation of small quantities of morphine:

The finely divided portions of the cadaver are repeatedly extracted with acidulated water (urine and other liquids being first concentrated by evaporation), the combined liquids filtered, evaporated to nearly a syrupy consistence on a water-bath, extracted with from 4 to 5 times its volume of 95 per cent. alcohol, again filtered, the filtrate freed from alcohol by distillation, the residue in the retort again filtered and then shaken with amylic alcohol as long as coloring matters continue to be abstracted. Thereupon the acid solution is heated from 50° to 60° C., an equal volume of amylic alcohol added and agitated, the liquid then made alkaline with ammonia water, and again agitated for some time. After the separation and removal of the amylic alcohol from the aqueous liquid, the operation is repeated by agitation with a fresh portion of amylic alcohol. The amylic alcohol liquids are then distilled or allowed to volatilize on a water-bath, the residue evaporated to dryness, and by the aid of a gentle heat, repeatedly extracted with slightly acidulated water. The acid liquids are then filtered, and the filter carefully washed. It is advisable to again agitate the acid filtrate with amylic alcohol, for the removal of the coloring matter, and then pour upon the separated acid liquid a mixture of two parts of anhydrous ether and 1 part of 95 per cent. alcohol, to make alkaline with ammonia water, and agitate. This agitation with ether-alcohol is to be repeated several times. In this way the morphine may be obtained, so deprived of coloring matters that all the reactions for the alkaloid may at once be applied.—Amer. Jour. Phar., April 1883, 191–192, from Pharm. Ztsch. für Russland, No. 4, 1883, pp. 49–51.

Sulphate of Morphine—Solubility of Different Commercial Samples.—Virgil Coblentz has determined the solubility of sulphate of morphine of different manufacture, following the process employed by Professor Tower (see Proceedings 1882), with the following results:

Sample.	Weight of			One part of the salt soluble at 15° C. in
	Solution.	$BaSO_4$	Morph. Sulph.	
I.	11.000 gm.	.1580 gm.	.5145 gm.	21.38 water.
II.	21.808 "	.2801 "	.912 "	23.90 "
III.	17.508 "	.232 "	.7554 "	23. 8 "
IV.	13.020 "	.226 "	.7359 "	17.69 "
V.	16.363 "	.265 "	.8625 "	18.97 "
Average.				21.00 water.

The samples were those of Powers & Weightman, Rosengarten, Merck, T. & H. Smith, and Chas. T. White.

In round numbers, one part of this salt requires from 18 to 24 parts of water at 15° C. for solution.—Amer. Jour. Phar., Sept. 1882, 436.

Morphia Salts—Solubility.—Mr. D. B. Dott contributes a paper on the solubility of morphia salts, in which he very thoroughly discusses the conditions necessary to insure correct results. The discrepancies which occur in the published statements of solubilities are primarily due to carelessness. Operating with pure material and with proper care, the results of different experimenters should be the same. These conditions the author has filled in the present instance. He regards the "method of digestion" as the one adapted to the solution of the compound. This digestion was made in each case at a temperature of 60° F. The quantity dissolved was then determined by evaporating a portion to dryness, the absolute weight of the dry residue being increased by the quantity of water of crystallization lost during the process of drying. In this manner the solubilities of the different morphia salts were determined to be as follows, the figures being the mean of a number of very closely corresponding determinations:

The Solubility of Morphia Salts at 60° F.

Acetate	1 part is soluble in	2½	parts of water.
Tartrate	" "	9¾	"
Sulphate	" "	23	"
Hydrochloride	" "	24	"
Meconate	" "	34	"

Phar. Jour. Trans., Nov. 18, 1882, 401–404.

Morphine—Detection in Quinine.—Brand directs attention to an extremely delicate and readily applied test which was first recommended nearly twelve years ago (see Proceedings 1873, 499) and which is as follows: A mixture is made of 6 drops of solution of ferric chloride sp. gr. 1.480 and 25 gm. of water; add to 15 drops of this liquid in a porcelain dish 3 drops of a solution of 0.1 gm. potassium ferrocyanide in 15 gm. of water. This mixture is of a brownish color, and in about 15 minutes becomes greenish; on the addition of a little quinine salt or of a neutral solution of it, there is instantly produced a blue precipitate in case of contamination with a mere trace of morphine.—Phar. Zeitung, 1883, W. 20. Am. Jour. Phar., May 1883, 260.

Morphine.—Proposed Solution in Oil for Medicinal Application, see *Liquores*, under "Pharmacy."

Narceine—New Reaction.—C. Arnold finds upon warming a trace of narceine with a mixture of equal parts of concentrated sulphuric acid and phenol a yellow and then a brownish color is obtained, which, when the phenol begins to volatilize, assumes a fine cherry red, permanent upon continued heating, and, upon the addition of a few drops of water be-becomes of a dirty whitish-yellow. Veratrine, when treated in the same way, gives the cherry-red coloration as with sulphuric acid alone, resembling very much that of narceine, but upon the addition of water becoming of a canary-yellow color. Codeine becomes at first of a dirty reddish-violet, and upon warming, of a dirty-brown. Delphinine at first brick-red, and upon warming, red-brown. The reactions of the sulphuric acid-phenol mixture with other alkaloids are not very characteristic.—Am. Jour. Pharm., Dec. 1882, 598, from Rep. An. Ch. 2,229, through Biederm. C. Bl.

Cinchona Alkaloids.—Modification of Prollius' method of assay of *cinchona barks*, which see under "Materia Medica."

Cinchona Alkaloids.—Isolation from *cinchona leaves*, which see under "Materia Medica."

Cinchona Alkaloids.—Simple process for determination in *cinchona*, which see under "Materia Medica."

Quinine.—Detection of morphine. See above.

Quinine—Falsification.—It has lately been discovered by the authorities of the hospitals of Paris, that for some time past the boxes of quinine supplied to public institutions have contained quinine at the orifice and centre of the boxes, while the remainder consisted of sulphate of cinchonine or sulphate of cinchonidine. At first the French papers accused the German and Italian manufacturers of the fraud; but it was soon shown that a Frenchman was at the bottom of it.—New Rem., April 1883, 108.

Quinine—Separation from Coated Pills.—Mr. Henry B. Parsons communicates the following method, which he has found to work well, and to be preferable to all others. Ether is used in preference to chloroform, because the latter is liable to dissolve decomposition products, which the ether does not.

Take a sufficient number of pills to represent twenty or forty grains of sulphate of quinine. The smaller number of grains is sufficient if manipulations are made with care, and the balance is sensitive to tenth-milligrams.

Treat the pills, in a very small Wedgewood mortar, with five cubic centimetres of cold distilled water, until the coating dissolves, and the pill mass may be ground under the pestle to a smooth, uniform paste. To this paste add two grams of freshly slaked lime (calcium hydrate) in powder. Mix thoroughly, and dry the mixture slowly in the mortar by means of a steam or water bath.

If glucose has been used as an excipient, the mass, in drying, will be colored yellowish, owing to formation of decomposition products, the result of the action of lime upon the glucose. These products do not interfere with the separation of the quinine in a pure state; the latter substance is not injured by the lime.

The dry mass should be finely powdered, and transferred to a Tollen's apparatus for continuous percolation, and thoroughly extracted with stronger ether. Upon evaporation of the latter from a weighed dish or flask, the quinine is left in residue. By drying for one hour at 125° C., the quinine is rendered anhydrous ($C_{20}H_{24}N_2O_2$), and may then be weighed. The weight of anhydrous quinine, in grams, multiplied by 20.7673 will give the number of grains of sulphate of quinine[$(C_{20}H_{24}N_2O_2)_2H_2SO_4.7H_2O$)] in the pills examined.

Where a Tollen's extraction apparatus is not at hand, very accurate results may be obtained by simply transferring the dry powdered lime and pill mixture to a small flat-bottomed flask, measuring in a known amount of stronger ether, corking well, agitating occasionally, and allowing to stand for not less than twelve hours.

By use of an accurate pipette, an aliquot portion of the clear ethereal liquid may be withdrawn and evaporated cautiously in a weighed dish.

A little experience is necessary to insure accurate results. The mass may be removed from mortar and pestle almost completely by use of a small steel spatula. In making the paste, previous to the addition of the lime, considerable labor may be saved if the mass is confined to as small a portion of the mortar as possible. With a deep, narrow mortar, 3 cc. of water is often sufficient. The use of more lime may be advantageous in some cases. The dried mass is easily pulverized, is not so light as to be lost in dust, and may be readily transferred from the mortar. The quinine separated is free from impurities.—New Rem., Mar. 1883, 67.

Quinine Salts—Preparation.—Mr. R. Rother gives working formulas for different quinine salts,the preparation of which may be profitably carried on in pharmacies. Of the two general methods in vogue, the direct union of the base with the required acid, and the decomposition of the sulphate by a salt of the acid required, the author seems to give preference to the latter.

Quinine Chloride is made by mixing 872 parts of quinine sulphate, 117 parts sodium chloride, and about 3,000 parts of alcohol, and warming to complete decomposition. The solution is then filtered from the crystalline sediment of sodic sulphate, and evaporated to a syrupy consistence, or until all or nearly all the alcohol is expelled. The dense solution may also be mixed with about 20,000 parts of hot water, when, on cooling, most of the chloride will crystallize in better defined shining needles.

Quinine hypophosphite is ordinarily made by dissolving the free base in hypophosphorous acid and crystallizing. The best result is obtained by dissolving 170 parts of calcium hypophosphite in 15,000 parts of water, heating the solution, and adding 872 parts of quinine sulphate, filtering after the calcium sulphate has subsided, and setting the solution aside to crystallize.

Quinine Sulpho-tannolate.—The author gives for this compound the formula: $(QnH_2)_2SO_4,HTn,Aq.$, and expresses the opinion that it should replace all the other indefinite so-called tannates of quinine. It is very easily prepared by the following formula:

Quinine sulphate	872 parts.
Tannin	322 "
Potassic acetate	98 "
Water sufficient.	

Dissolve the tannin and potassic acetate in 10,000 parts of water, with heat, then add the quinium sulphate, continue the heat for a few minutes, transfer the precipitate to a filter, and, after sufficient washing, dry it by exposure in the open air.

Quinine Eriodictyonate.—This compound can readily be obtained by extracting the leaves of *Eriodictyon Californ.* with water containing some alcohol and ammonia, mixing the liquor with quinine sulphate, warming gently, washing the precipitate, and drying it by exposure. The salt possesses the insolubility of tannate of quinine, over which it possesses the advantage in being a definite compound, and in being readily decomposed by common acids into the free acid resin and a soluble quinine salt. It is soluble in ammonia.

Quinine Valerianate.—This is best made by the following formula:

Quinine sulphate	872 parts.
Valerianic acid	204 "
Calcium carbonate	100 "
Alcohol. Water	of each sufficient.

Mix the valerianic acid with 5,000 parts of water, add the calcium carbonate, and, when effervescence has ceased and a clear solution has resulted, add 2,500 parts of alcohol and the quinine sulphate. Now heat the mixture until decomposition is complete; filter whilst hot, and rinse the residue of calcium sulphate with a little alcohol or weak alcohol, and set the filtrate aside to crystallize. Collect the crystals on a filter, and when drained expose them in the open air to dry. The drained liquor on evaporation will yield an additional crop of crystals.—Amer. Jour. Phar., April 1883, 170–177.

Sulphate of Quinine—Value of Ether-test.—Mr. A. J. Cownley draws attention to the fact that the Ether-test for sulphate of quinine is totally unreliable when sulphate of cinchonidine is present. The test of the Br. Phar. requires so large an amount of ether that sulphate of quinine, containing nearly 30 per cent. of sulphate of cinchonidine, might be passed as pure. Even when much smaller quantites of ether are employed, the test is unreliable for the detection of sulphate of cinchonidine. Thus he finds that when he applies Mr. H. Byasson's modification (Jour. de Pharm. (5) vii. 291), which consists in agitating 0.5 grain of the sample with 6 cc. of ether, and 2 cc. of .950 ammonia solution, it is impossible to detect the presence of even 20 per cent. of the cinchonidine salts, and if the quantity of ether is reduced so as to be just short of allowing the gelatinization of the alkaloid, it is quite possible to fail to obtain evidence of the presence of 10 per cent. of cinchonidine salt. So far as quinidine and cinchonine are concerned, they are less likely to be present, and their presence may be more easily ascertained,—Phar. Jour. and Trans., May 12, 1883, 917.

Quinine Iodate and Bromate—Physiological Action—Preparation, etc.—Dr. Charles A. Cameron draws attention to the physiological activity of the iodate and the bromate of quinine. The iodate has been in use for some years in the form of an effervescent compound containing 2 grains in each drachm, and has been found a very useful remedy in the treatment of neuralgia, severe articular pains, sluggish forms of pulmonary congestion, secondary syphilitic disease, and malarial enlargement of the spleen.

Quinine Iodate may be prepared by digesting freshly precipitated and still moist quinine with a warm solution of iodic acid (1 part to 8 or 10 parts of water) in the proportion of a molecule of each. The resulting mass cannot be dried at the water-bath heat, as it causes some decomposition of the salt. Dried at a temperature of 60° F., and then placed *in vacuo* over sulphuric acid, it undergoes no further loss of weight. The salt has a white-pearly appearance, and consists of extremely minute needle-shaped crystals, which contain no water. Boiling water does not decompose it. It is very slightly affected by strong sulphuric acid. Hydrochloric acid and dilute sulphuric acid dissolve it readily; it is not quite so soluble in acetic acid. Spirits of wine dissolve it readily; in ether and chloroform it is sparingly soluble; it requires 700 parts of cold water for solution, but is much more soluble in warm water. The mean of several determinations leads to the formula $C_{20}H_{24}O_2N_2HIO_3$.

Quinine Bromate has the same constitution as the iodate, but is much more soluble in water, requiring only 250 parts of cold, and less of warm water. The dry salt is not discolored by the heat of a water-bath, but the solution, when evaporated to dryness, leaves a more or less colored residue. It is readily dissolved by hydrochloric and dilute sulphuric acids, and in spirit of wine. Acetic acid acts less readily upon it. Touched with a drop of strong sulphuric acid, it emits a puff of dark smoke, and almost wholly disappears. Like the iodate, it appears to have valuable remedial action.—Phar. Jour. Trans., July 1, 1882, 6–7.

Tannate of Quinine.—Preparation.—Julius Fiebert recommends the following process for obtaining this compound tasteless: Dissolve 20 parts of sulphate of quinine in 80 parts of water with the aid of sufficient dilute sulphuric acid, dilute with sufficient water to obtain about 1000 parts of solution, and add thereto a solution of sodium carbonate 40 parts in water 160 parts. Collect the precipitated hydrate of quinine in a filter, wash well with cold distilled water, drain, and while still moist, dissolve in 200 parts of 96 per cent. alcohol, filter, and drop the filtrate, with continued agitation, into a clear solution of 60 parts of tannin in 1000 parts of cold distilled water; set aside for several hours, collect the nearly white precipitate upon a moist filter, wash with distilled water of 30°C., until the filtrate has no longer any astringent taste, drain, dry upon bibulous paper at a moderate temperature, and rub to powder. The yield is between 60 and 65 parts.—Amer. Jour. Phar., Feb. 1883, 100, from Zeitschr. Oester. Apoth. Ver., 1882, p. 431.

Sulphophenate of Quinine—Preparation, etc.—Zinno has analyzed this salt, first prepared by Prota Giurleo; it contains 52 per cent. of quinine, 20 per cent. of sulphophenic acid, and 28 per cent. of water of crystallization. The salt is made by directly combining the alkaloid with sulphophenic acid, or by decomposing a solution of sulphophenate of lead (or of barium) by means of quinine sulphate. Since the salt is difficult to crystallize, it is best dispensed in solution, which should be accurately titrated. —Am. Jour. Phar., Oct. 1882, 515, from Annali di Chimica, lxxiv. 282.

Hydroquinone—Formation by the Oxidation of Quinidine.—By the oxidation of quinidine by potassium permanganate, in a solution which is kept acid, C. Forst and Chr. Bœhringer have obtained a product of oxidation which is crystallizable from alcohol in small needles, while at the same time formic acid is produced, and a base crystallizable in prismatic needles, soluble in alcohol, and rapidly efflorescing on exposure to the air. The authors have determined simply the water of crystallization of this base, which they regard as *hydroquinidine*, $C_{20}H_{26}N_2O_2 + 2\frac{1}{2}H_2O$, and as produced during oxidation.

From its solution in ether this base is deposited in thick tables, which are apparently rhombic; its alcoholic solution has an alkaline reaction. Hydroquinidine is dextrogyrate, and to about the same extent as quinidine; its fusing point is also about the same, being 166 to 167° C. It yields with chlorine and ammonia the reaction of quinine and quinidine, and its solution in dilute sulphuric acid presents a blue fluorescence; its salts crystallize readily. The *chloroplatinate*, $(C_{20}H_{26}N_2O_2HCl)_2PtCl_4 + 2H_2O$, is deposited on cooling in short orange-colored needles. The *hydriodate* crystallizes in anhydrous striated needles, slightly soluble in cold water, and containing, according to the estimation of the iodine, $C_{20}H_{26}N_2O_2HI$. The *sulphate*, $(C_{20}H_{26}N_2O_2)_2H_2SO_4 + 12H_2O$, of which only the water of crystallization has been determined, forms voluminous many-faced crystals. The hydrochlorate forms short needles, which are sparingly soluble in cold water.—Am. Jour. Phar., Aug. 1882, 401, from Bull. Soc. de Phar. de Bordeaux, through Ber. d. d. Ch. Ges. xiv., 1954.

Hydrocinchonidine—Character, etc.—In continuation of his researches on the cinchona alkaloids, O. Hesse finds that this alkaloid is frequently contained in commercial cinchonidine and homocinchonidine and their salts, especially in the respective sulphates, when they do not form loose crystalline needles. In order to prepare hydrocinchonidine therefrom, it is only necessary to convert them in the usual way into hydrochlorates, and to allow these to crystallize from water. The hydrochlorate of hydrocinchonidine thereby remains in the mother liquid, is obtained by evaporation, and finally obtained therefrom in a pure condition. It crystallizes from hot dilute alcohol in beautiful six-sided laminæ, and from strong alcohol in short prisms.

Hydrocinchonidine has the formula $C_{19}H_{24}N_2O$, and therefore bears the same relation to cinchonidine as hydroquinine to quinine; it melts at 229–230° C., and does not show in the acid sulphuric, acetic, and nitric acid solution, even when highly diluted, the slightest blue fluorescence, nor does it give with chlorine and an excess of ammonia, any coloration.

Hydrochlorate of Hydrocinchonidine, $C_{19}H_{24}N_2O, HCl + 2H_2O$, forms short, six-sided prisms, which are readily soluble in water and in alcohol. If the neutral salt be dissolved in very strong hydrochloric acid, the acid salt crystallizes in colorless tables.

Oxalate of Hydrocinchonidine $(C_{19}H_{24}N_2O)_2, C_2H_2O_4$, is obtained by precipitating the hot aqueous solution of the hydrochlorate by means of oxalate of ammonium, whereby it separates upon cooling in small, colorless, shining anhydrous needles.

The neutral sulphate crystallizes with 7 (or 8?) molecules of water, but effloresces very readily; the acid sulphate crystallizes with 4 molecules of water.—Amer. Jour. Phar., Feb. 1883, 90, through Archiv der Pharm. Bd. xvii, p. 860, from Liebig's Ann. Chem., 204, p. 1.

Chinolines—Halogen Derivatives.—W. La Coste prepares these derivatives in a manner differing from the original of Skraup. 86 grams of bromaniline and the corresponding quantity of glycerin, sulphuric acid and nitrobenzol, are carefully heated. The product was distilled with steam after diluting with water. The residue contained 70 grams of pure monobromchinoline. Dinitrochinoline and phenylchinoline were prepared by similar methods.—Amer. Jour. Phar., Jan. 1883, 20, from Jour. Amer. Chem. Soc., Nov. 1882; Berichte, xv., p. 557.

Kairine—A New Alkaloid Prepared by Synthesis.—Professor Dr. Otto Fischer has prepared synthetically an alkaloid, which he has named kairine.

For obtaining it, *oxychinoline* is first prepared by C. Bedall and O. Fischer ("Berichte," 1881, pp. 442 and 1366), from Lubavin's (1869) chinoline sulphonic acid, by melting it with caustic soda, dissolving in acidulated water, adding sodium carbonate, and distilling with a current of steam. It is regarded as identical with the *chinophenol* of Weidel and Cobenzl (1880).

The potassium salt of oxychinoline is readily converted into the methylic ether, *methoxychinoline* or *chianisol*, $C_{10}H_9NO$, by treatment with methyl iodide (Ibid., p. 2570). The compound named subjected to reduction by tin and hydrochloric acid, unites with 4 atoms of hydrogen, forming *methoxychinoline tetrahydruret*, $C_{10}H_{13}NO$, the new alkaloid under consideration, which is a heavy thick oil, soluble in hot water, freely soluble in ether and ligroin, and having a sweetish odor, somewhat resembling that of methyl-aniline, and becoming pungent on heating. Ferric chloride imparts an intense red color, which disappears gradually on heating. The hydrochloride, ($C_{10}H_{13}NO.HCl$), is precipitated in crystalline floccules on passing a current of dry hydrochloric acid into an etherial solution of the base, and crystallizes from alcoholic ether in thick, colorless prisms.

Professor Dr. Filehne, of Erlangen ("Berl. Klin. Woch.") describes the Kairine hydrochloride as a gray-yellowish crystalline powder, which is easily soluble in water, and has a bitter saline, at the same time aromatic odor, resembling somewhat that of guaiacol, but not burning. Doses of 1.0 or 1.5 gram, taken by healthy adults, are without any physiological action. The dose for sick adults, particularly if weakly, should not exceed 1.0 gram every two hours, to prevent cyanosis. Doses of 1.0 gram should be given at intervals of not more than two and a half hours, and 0.5 gram every one and a half, or not exceeding two hours; the author prefers to give 0.3 to 0.5 gram every hour or hour and a half.—Amer. Jour. Phar., Feb. 1883, 100.

Strychnine—Effect of Melting Potassa.—H. Goldschmidt observed that on melting 1 part of strychnine with 10 parts of potassa and a little water, a milky liquid having a chinoline-like odor distils first, afterwards heavy yellow drops, which partly congeal in the condenser. This substance is decomposed by dilute acids yielding a compound agreeing in its reactions with *indol*.—Am. Jour. Phar., Dec. 1882, 628, Chem. Ztg., 1882, No. 61, from Berichte, xv., 1997.

Sulphate of Strychnine—Composition and Solubility of the Commercial Salt.—The results of the investigation concerning the composition of sulphate of strychnine of German commerce, by Rammelsberg (see Prac., 1882, 420), and the variance with the formula which has been assigned to the salt adopted by the United States Pharmacopœia, have induced Mr. M. W. Coleman to make a series of experiments with sulphate of strychnine of American commerce, selecting for this purpose salts of the manufacture of Messrs. Rosengarten & Sons, and Powers & Weightman. The results of these experiments show that strychnine sulphate of American manufacturers is distrychnine sulphate, having the formula $(C_{21}H_{22}N_2O_2)_2H_2SO_4 + 6H_2O$. It is soluble in from 42 to 43 parts of water at 15°C. It becomes anhydrous at 185°C., without fusion, losing from 12.099 per cent. to 12.5 per cent. of its weight, and is decomposed at a temperature about 225°C. This is also at variance with the requirements of the United States Pharmacopœia, according to which the salt contains 7 molecules of water crystallization, and when heated to a temperature of 135°C, first melts, and then loses its water of crystallization.—Amer. Jour. Phar., March 1883, 113–116.

In connection with the above, the following, from "Jour. Pharm. et Chim." ((5), vi. 259), is of interest. The French Codex of 1866, orders the normal sulphate containing $7H_2O$ and corresponding with the formula determined by Regnault in 1838. The correctness of this formula was doubted by Schabus (1855), and subsequently Des Cloizeaux and Rammelsberg prepared hydrates of strychnine sulphate, containing 5, 6, and 6½ H_2O. Lextreit has recently examined numerous samples of the salt as it is met with in French commerce, and found that the normal and acid sulphates are used indiscriminately. He obtained the acid sulphate with 2 H_2O in short needles, at an elevated temperature, and in thin needles several centimeters long, when evaporated at a low temperature. Owing to its caustic properties, it is not suited for medicinal use, more particularly not for subcutaneous injections.

The normal sulphate with 5 H_2O is obtained from strychnine 10 parts, pure sulphuric acid 1.27 parts, and alcohol 50 parts; using a moderate heat for dissolving, the salt is soluble in 75 parts of alcohol. Using a somewhat diluted alcohol, large prismatic crystals are formed, but when the strength is reduced to below 50 per cent., the salt is mixed with the hydrate containing $6H_2O$, crystallizing in square plates. The latter is obtained by replacing the alcohol in the above directions with 35 parts of water and crystallizing at 70°C; above this temperature a mixture of the two hydrates may be obtained. The author prefers for medicinal use the salt with $5H_2O$, because it is uniformly procured from the solution in strong alcohol.—Am. Jour. Phar., May 1883, 272.

Aspidospermine—Administration.—This active principle of quebracho bark, which has lately acquired some reputation for the relief of difficult breathing attending asthma, emphysema, phthisis, etc., is given in doses of about one-third of a grain; the dose of the bark being about half a drachm. Eulenberg gives in the Medicinal Kalendar for 1883, the following formula for its exhibition:

Aspidospermine	gr. xv.
Distilled water	fl. ℥ iss.
Sulphuric acid	q. s.

To make a solution.
M. Dose, 15 minims.

—New Rem., Mar. 1883, 77.

Atropine.—Successful Synthetical Preparation.—It has long been known that atropine is split up by boiling solution of baryta into a basic substance *tropine*, and into *tropic acid.* For a number of years past, the constitution of these bodies has engaged the attention of several chemists, among them Prof. Ladenburg, who has contributed the most important new facts. Up to the present time, the attempts to recombine tropine and tropic acid into atropine has been unsuccessful, but at last they have been crowned by success. Ladenburg found that tropine and tropic acid combined to a regular salt, tropate of tropine, which was, however, almost devoid, even in ten-per-cent. solution, of any action on the pupil of the eye. It then occurred to him to act upon the salt with substances which have the property of withdrawing water, among which the most active, for the special purpose in view, was found to be diluted hydrochloric acid. Pure tropate of tropine was dissolved in fifteen to twenty parts of water, mixed with a few drops of diluted hydrochloric acid, evaporated on the water-bath to dryness, again dissolved in water, acidulated and evaporated, and this process repeated very frequently during several days. Finally, the residue was again dissolved in water, almost completely neutralized with very dilute solution of carbonate of potassium, an oily substance (tropid) which had separated filtered off, and the filtrate precipitated by a twenty-per-cent. solution of carbonate of potassium. The residue, which at first was oily, soon became crystalline. The crystals were pressed, dissolved in a little alcohol, and the solution poured in five times its volume of water, whereupon fine-shining needles separated, after a short time.

These needles proved to be *pure atropine*, having all the physical, chemical and physiological properties of the latter.

Tropic acid, one of the decomposition products of atropine, has already been prepared synthetically by Ladenburg (starting from acetophenon), and also by Spiegel. It now remains only to discover the true constitution of tropine. Ladenburg has contributed numerous facts, by extended researches, which have gradually thrown light on this subject, and he has now made a most important further step, which promises to lead to success. From tropidine, namely, one of the decomposition products of tropine, he has succeeded in obtaining dibropyridine, which itself has been already prepared synthetically, and the constitution of which is fully known and understood. It remains only to discover the true relation of tropine with pyridine, or with piperidine, from which it is evidently derived.—New Rem., June 1883, 171, from Liebig's Annal. der Chem., 217, 74 sqq.

Atropine.—Percentage occurring in plants of one and of two years' growth. See *Belladonna*, under "Materia Medica."

Hyoscyamine—Therapeutic Effects.—Dr. Thomas Browne has made some experiments to determine the therapeutic value of hyoscyamine, with the results given below. The formula for its administration was the following, which was found to meet every requirement as to strength, but lacks stability: Hyoscyamine (Merck's crystalline), four grains; glycerin, distilled water, of each half an ounce; carbolic acid, two minims;

dissolve without heat. Dose, four to eight minims, given hypodermically.

It is very important to make the solution without heat, as heat renders the alkaloid nearly inert. Hyoscyamine is a most unstable alkaloid, and soon decomposes; so that the strength of any solution yet devised cannot be depended on for more than one month after its preparation.

1. The observations show the uncertainty of the action of hyoscyamine when given by the mouth, and the danger of large doses.

2. They also show the marked superiority of the hypodermic method, and the confidence with which, in some cases, its effects could be calculated on, and the dose increased or diminished in accordance with the violence of the patient.

3. In hyoscyamine we have a drug which is often capable of controlling the violence of a furious maniac; and, it may be, checking the torrent of rushing ideas on which he is borne along, soothing without putting him to sleep; and, in these respects, differing from morphia or chloral. In noisy and destructive general paralytics, the quiet air of comfort and repose following a moderate dose was such a contrast with the previous condition as to strongly impress every one with the feeling that, by the introduction of hyoscyamine, another valuable aid had been secured in the care and treatment of such cases.

4. No curative action can be claimed for the drug. Even in acute mania it did nothing more than moderate or check, for a time, the violence of action, and, perhaps, render less vivid and overwhelming the terrifying whirlwind of delusion of the frantic patient.

Previously to procuring a supply of hyoscyamine, the ordinary tincture of hyoscyamus was given in large doses, sometimes as much as one ounce at a time, without much effect, except that of dilating the pupils; but it had no controlling power in cases which afterwards yielded to the more powerful alkaloid.—Amer. Jour. Phar., Mar. 1883, 153, from British Med. Jour., through Atlanta Med. Register, Jan. 1883.

Hyoscine—Mydriatic Value.—Hyoscine, prepared by Ladenburg, and crystallizable by hydriodic acid, has proved to possess, if dropped into the eye, a remarkably rapid mydriatic effect, and surpasses in this respect atropia in a high degree. But the solution should be only a half per cent. one, as stronger solutions (one and a half per cent.) cause already general symptoms, as unconsciousness, disturbances of articulation, vertigo, and dryness of the throat. It may be mentioned that this preparation seems to be well tolerated by the conjunctiva, even if kept a long time in contact with it.—Amer. Jour. Phar., Dec. 1882, 630, from Medical Press; Louisv. Med. News, Nov. 4.

Veratrine—Researches Relating to the So-called Officinal Article.—Dr. Emil Bosetti, selecting the so-called officinal veratrine as the starting point, has obtained the following results of his exhaustive research:

1. The pure officinal veratrine consists of a very homogenous, externally amorphous mixture of two isomeric alkaloids, having the formula $C_{32}H_{49}NO_9$, of which the one is crystallizable and practically insoluble in water—crystallized veratrine (cevidine of Wright and Luff)—the other uncrystallizable, but soluble in water. The latter is called by the author *veratridine;* it is identical with the soluble veratrine of Weigelin and E. Schmidt. Relatively small amounts of the first mentioned alkaloid suffice to render the latter insoluble in water; and, on the other hand, small amounts of the latter are sufficient to prevent the crystallization of the former.

2. By boiling with an alcoholic solution of barium hydrate, both of these alkaloids are split in the following manner:

(*a*) Crystallized veratrine is decomposed into angelic acid and amorphous cevidine:

$$C_{32}H_{49}NO_9 + 2H_2O = C_5H_8O_2 + C_{27}H_{45}NO_9.$$

(*b*) Veratridine is decomposed into veratric acid and amorphous veratroine, according to the equation:

$$2C_{32}H_{49}NO_9 + 2H_2O = C_9H_{10}O_4 + C_{55}H_{92}N_2O_{16}.$$

The cevidine, $C_{27}H_{45}NO_9$, forms a yellowish-white powder, having an alkaline reaction and peculiar sweetish taste. Veratroine forms after drying and trituration a yellowish-white powder, the dust of which incites violent sneezing and coughing. It is sparingly soluble in water but readily soluble in chloroform, ether, amylic alcohol, benzol and carbon bisulphide.—Amer. Jour. Phar., May 1883, 263, from Arch. Pharm., 21, 81, through Chem. Ztg., No. 24, 1883, 360.

Colchicine—Production in Well Crystallized Form.—In a communication to the Austrian Academy of Science, Dr. S. Zeisel states that he has obtained well-crystallized colchicine from a chloroform solution; the solvent adhering persistently to them, it is not impossible that the crystals may be a compound with chloroform, though their aqueous solution possesses all the characteristic properties of colchicine. In preparing colchiceine from colchicine, the author obtained a new base,

Apocolchiceine, which has both basic and acid characters. It may be obtained in larger quantities, besides methyl chloride, on heating colchiceine with hydrochloric acid; and on increasing and continuing the heat, another substance is obtained having acid properties.—Amer. Jour. Phar., May, 1883, 268, from Phar. Post, 1883, W. 10.

Caffeine—Formation of Soluble Double Salts.—Mr. C. Tanret describes experiments made to determine the relation of caffeine to different acids. He finds that it is incapable of forming soluble salts with many of the acids, that most of the salts of caffeine mentioned in therapeutical works do not exist, and that those that do cannot be employed because they are decomposed by water into acid and caffeine. Experiments were, therefore, made with the idea of employing the natural salt which holds the caffeine in combination in coffee, the

Chlorogenate of Potash and Caffeine of Payen.—But this salt, besides being very difficult to obtain in quantity, is very alterable in the air when in solution, and besides contains only 29 % of caffeine. In view of the apparent similarity that exists between chlorogenic or caffetannic acid and benzoic, cinanmic, and salicylic acids, the author conjectured that double salts, analogous to Payen's salt, could be formed with the three last named acids, and this proved to be the case. In the presence of the sodium salts of these acids caffeine dissolves in a very small quantity of water, and thus form solutions which are very suitable for hypodermic use, being very rich in caffeine.

Cinnamate of Soda and Caffeine contain 58.9 % of caffeine (170 cinnamate to 244 caffeine).

Benzoate of Soda and Caffeine contains 48.5 % of caffeine (288 benzoate to 244 caffeine).

Salicylate of Soda and Caffeine contains 61 % of caffeine (160 salicylate to 244 caffeine).

Solution can be made extemporaneously of the two first named double salts, representing 20 centigrams of caffeine in the cc., and the salicylates to represent as much as 30 centigrams per cc.

Double salts were also obtained with *acetic*, *lactic*, *citric*, *sulphuric* and *hydrochloric* acids.—Phar. Jour. Trans., Aug. 5, 1882, 103–104, from Jour. de Pharm., (5), v., 591.

Coffeine and Salts—Character, etc.—Dr. H. Biederman found coffeine dried at 100°C., in accordance with the statements of former investigators to have the formula $C_8H_{10}N_4O_2$; it melts at 230.5°C.

Hydrochlorate of Coffeine. $C_8H_{10}N_4O_2$, $HCl + 2H_2O$, forms colorless transparent crystals of the monoclinic system; the hydrobromate has an analogous composition, whilst the nitrate crystallizes with one molecule of water.

The *sulphate* $C_8H_{10}N_4O_2$, H_2SO_4, is very readily obtained by dissolving the coffeine in about ten times its weight of hot alcohol, to which sufficient H_2SO_4 has been added to impart a strongly acid reaction. Upon cooling it separates in the form of well-developed, transparent, short needles, which are grouped in rosettes.

Coffeine-gold chloride, $C_8H_{10}N_4O_2$, $HCl + AuCl_3 + 2H_2O$, forms golden-yellow, shining laminæ.

The *formiate*, *acetate*, *butyrate*, and *valerianate* were likewise formed they were all anhydrous, and it is only to be observed that the acetate shows the deviating composition $C_8H_{10}N_4O_2(C_2H_4O_2)_2$—Amer. Jour.

Phar., June 1883, 298, from Arch. Phar., 21, 175, through Chem. Ztg., 1883, No. 30.

Caffeine and Theobromine.—Presence in the seeds of *Sterculia acuminata* (Cola nuts), which see under "Materia Medica."

Pelletierine Tannate—Tænifuge Value.—Dr. Berenger-Feraud ("Bulletin Générale de Therapeutique," translated in the "Medical Times") communicates the results of the various kinds of treatment for the removal of the tapeworm: Oil of turpentine, male fern, pumpkin seed, kooso, pomegranate root bark and pelletierine tannate. This last he considers the most powerful of all agents, as complete success was obtained in forty-six per cent. of the cases. As soon as proof of the presence of the intruder is obtained, the patient is put upon milk and bread for the next two meals. On the next morning before rising an infusion of ten grams of senna leaves in one hundred grams of water sweetened with thirty grams of syrup of orange peel is administered. An hour later the patient takes half the dose of pelletierine diffused in twice its weight of water. The patient should lie still with closed eyes to prevent nausea and vomiting. Half an hour later the rest of the drug is given. After another half hour thirty or forty grams of castor oil are given. Should there be no stool an hour afterward, purgative enemata are given. Success in this treatment appears to lie in the rapidity of the purgation. —Amer. Jour. Phar., Dec. 1882, 631, from Chic. Med. Rev., Oct. 15.

Gelsemine—Additional Characters—Supplementary to a former paper on the subject (see Proceed. 1877, 312), Prof. Theodore G. Wormley communicates the following important properties and reactions of gelsemine. In its pure state gelsemine is colorless, odorless, and persistently bitter; has not yet been obtained in crystals; fuses to a colorless liquid somewhat below 100° C.; completely neutralizes acid, forming salts, most of which are freely soluble in water and alcohol. The pure alkaloid is soluble, under ordinary conditions, in 644 parts of water. *Sulphuric acid* dissolves gelsemine with reddish or brownish color; the solution assumes a pinkish hue after a time, and if warmed on a water-bath acquires a more or less purple or chocolate color. The addition of a small crystal of *bichromate of potassium* to the sulphuric acid solution produces on stirring reddish-purple streaks along the path of the crystals. If the potassium salt is used in fine powder, or if it is replaced by ceric oxide, as advised by Sonnenschein and Robbins, this color is developed more promptly and strongly, and is manifest even with one ten-thousandth grain of pure alkaloid. *Nitric acid* produces a brownish-green color, quickly changing to deep green, which slowly diffuses itself through the liquid and is manifested by the least visible quantities of the alkaloid. This reaction serves to distinguish gelsemine from strychnine. Solutions of gelsemine salts, which are colorless and brittle, yield precipitates with a number of reagents, but none of them are distinctive. Regarding the physiological action of gelsemine, and of the preparations of gelsemium root, the author states that ⅛ grain, administered hypodermically to a cat, caused very marked symptoms in fifteen minutes, and death in one hour and a half. Of twenty-five cases of gelsemium poisoning, thirteen proved fatal, the fatal period varying from one to eight hours. It the case of a child aged three years, about twelve minims of the fluid extract proved fatal; in that of a healthy man, fifteen minims of the fluid extract, repeated at short intervals, produced death in less than four hours after the last dose. There is no direct antidote known. Electricity, and the use of morphine hypodermically, have been attended with good results.—Amer. Jour. Phar., July 1882, 342–344.

Gelsemine—Isolation and Charater in a Pure Condition.—Mr. A. W. Gerrard has succeeded in isolating *Gelsemine* and preparing some of its salts in a perfectly pure condition. The results of his observation show in the main the following differences from previous researches: (1) that the alkaloid gelsemine can be obtained in a state of purity as a crystalline colorless solid, forming crystalline salts with acids, and giving no color reactions with nitric or sulphuric acids; (2) that the pure base has the formula $C_{12}H_{14}NO_2$, thus differing greatly from the formula obtained by Sonnenschein, who, it is certain, must have used an impure substance, as shown by the color reactions his alkaloid gave with nitric and sulphuric acids.

Method of Extraction.—Twelve kilograms of well-powdered root were exhausted with alcohol, which left after distillation 1703 grams of soft extract. The extract on resting, separated into two strata.

The superstratum, green in color and having the appearance of an oleoresin, was removed and found to be practically insoluble in water; it was well shaken with dilute hydrochloric acid to remove traces of adhering alkaloid, and the said solution mixed with the substratum. The substratum, containing the alkaloid, was diluted with water until it ceased to precipitate resin, and left a clear bright brown solution, which was evaporated at a temperature below 60°C., treated with ammonia in excess, and thoroughly washed with ether. The ether solution, now containing the gelsemine and beautifully fluorescent from the presence of gelseminic acid, was decanted and exposed a short time to allow excess of ammonia to escape. Hydrochloric acid was next added in fractions with agitation until the fluorescence was destroyed, a certain indication that the whole of the alkaloid had been removed from the ether. The hydrochloride of gelsemine had now separated from the ether, forming a layer of pale yellow amorphous precipitate, which upon separation was subjected to several reconversions, until the last traces of color and fluorescence had disappeared, the product being 20.2 grams of perfectly white hydrochloride of gelsemine. It may here be mentioned that the pure alkaloid obtained from the hydrochloride by alkali, and chloroform or ether, holds its solvents tenaciously, and requires the heat of a water-bath to effectually remove them. During their removal the gelsemine swells into vesicles which, on cooling, can be easily powdered.

Properties of Gelsemine.—It is a brittle, transparent solid, crystallizing with difficulty from alcohol. Boiling water sparingly dissolves it, the solution on cooling becoming faintly turbid from separation of gelsemine. It softens at 38° C. and becomes fused at 45° C. Heated on platinum it ignites, burning with an orange-yellow flame, and leaving no trace of residue. Solutions of its salts have a distinctly, but not a powerfully bitter taste, and give with potash or ammonia white precipitates soluble in excess. If the solution containing excesss of ammonia be exposed to the air, as the ammonia is eliminated the gelsemine separates in granular crystals. The pure base gives no color reaction with strong nitric acid, and the mixture is scarceiy changed in color by heating. Strong sulphuric acid has no apparent reaction upon it; but if to the mixture a little manganic oxide be added, and rubbed with a glass rod, a deep crimson red is obtained, passing to green. This reaction is exceedingly delicate, and can be easily shown by dissolving 1 milligramme of pure gelsemine in 10,000 milligrammes of strong sulphuric acid, then adding a few milligrammes of manganic oxide. It can be even demonstrated with a solution of 1 in 100,000. If the preceding reaction is performed upon the pure alkaloid, the color is sufficiently intense to cause it to be mistaken for strychnia; but if a parallel experiment be carried on with strychnia the two alkaloids cannot be mistaken, for the strychnia gives an intense purple, passing to red. Picric acid gives a yellow crystalline precipitate; gold chloride, a yellow amorphous precipitate, soluble in boiling water, separating on cooling, partly in crystals. Platinic chloride gives a yellow precipitate, soluble on boiling.

The following salts were prepared and obtained in crystals: Hydrochloride, hydrobromide, sulphate and nitrate. The hydrochloride is a moderately soluble salt, separating from water as an apparently amorphous powder, consisting really of small granular crystals. It is sparingly soluble in cold, more soluble in hot alcohol; from the latter it separates slowly in prismatic crystals. The hydrobromide crystallizes more readily from water and alcohol than the hydrochloride, forming prisms. The sulphate and nitrate are very freely soluble in water and alcohol, and crystallized indifferently on spontaneous evaporation.—Amer. Jour. Phar., May 1883, 256–260.

Gelsemine—Distinction from Strychnine, etc., in Forensic Determinations.—Dr. Edward Schwartz, after briefly reviewing the different investigations of gelsemium and its constituents, gives the results of his own investigations, from which he concludes that *æsculin* (which see under "Glucosides") is a constituent of the root, and composes the larger part of the *gelsemic acid* (which see under "Organic Acids,") as obtained by

Dragendorff's method. He has, furthermore, isolated gelsemine, which he finds to show under certain conditions the same reaction with sulphuric acid and bichromate of potassium as strychnine. For distinguishing it from the latter, the following properties are, therefore, useful:

I. The reactions. (1) to concentrated sulphuric acid; (2) to sulphuric trihydrate and potassium bichromate (or ceric oxide or peroxide of manganese or of lead; (3) to Brouardel-Boutmy's reagent; (4) to sugar and concentrated sulphuric acid.

II. The action upon the animal body; and

III. Its association in the root with æsculin.

The physiological experiments made by the author, gave results which agree with the observations of Professor Ott (1875), and Dr. Moritz (1878). He details his experiments made for the detection of æsculin (gelsemic acid?) and gelsemine, made with food, blood, and urine, both fresh and putrid, and with poisoned cats; and has found that æsculin may be found in all organs, while gelsemine is found in the stomach, intestines, blood, and liver.

Gelsemine is distinguished from quebrachine; (1) by not being extracted by chloroform from acid solutions; by the reactions: (2) with sulphuric acid and potassium trihydrate; (3) with Frœhde's reagent; (4) with sulphuric acid containing iron; and (5) by the absence of æsculin from quebracho bark.

The mode of isolation, the reaction with Frœhde's reagent, and the association with æsculin in the drug, serve to distinguish gelsemine from geissospermine.

For distinguishing it from aniline and curarine consult Dragendorff, "Ermittelung der Gifte."—Amer. Jour. Phar., Aug. 1882, 389–394.

Tannate of Cannabine—Therapeutic Value.—Dr. Dornmüller has experimented with tannate of cannabine, as furnished by Mr. Merck, of Darmstadt, and has obtained highly satisfactory results with it as a therapeutic agent.

This *tannate of cannabine* appears in form of a yellowish-brown powder, insoluble in water and ether, scarcely soluble in alcohol, having a peculiar, not disagreeable odor, and a bitterish tannin-like taste. When magnified three hundred diameters, it is seen to consist of sharp-edged, brownish and amorphous plates.

The preparation of the salt, according to Merck, is quite circumstantial, owing to its being easily decomposed. In form of tannate, however, it remains pure and unaltered. The addition of a small quantity of alkali renders the preparation soluble in water.

By distilling Indian hemp with water, an ethereal oil is obtained which consists of cannabene and cannabene hydride. A sample of the latter body was sent to the auther by Mr. Merck. It was a quite thin, golden-yellow liquid of a very repulsive odor and taste, and highly poisonous.

A small quantity of it, injected hypodermically, produced such a strong reaction, locally and generally, in two young persons upon whom it was tried, that it exceeded anything previously seen by the author. Upon the forearms of the two persons there were formed, after a short time, gigantic abscesses, and a violent fever set it. Prompt lancing and dressing, by Lister's method, impeded further progress of the trouble. Fortunately, the danger passed over in a short time. These trials had this advantage, at all events, that they proved the presence of a poisonous substance among the constituents of Indian hemp. And it is this substance which is removed in the preparation of tannate of cannabine. This is the reason why the hypnotic effect of this compound is milder, but quite as decisive as that of the extract of Indian hemp itself.

Tannate of cannabine has been used by the author, so far, 57 times in the hospital, and six times by his son in private practice; 21 of the cases were males, 42 were females; age 17 to 73 years, the majority between 20 and 40. Most of them were female servants, journeymen, and mechanics, 40 of whom had phthisis, 4 abdominal tumors, 3 chronic bronchitis, 2 lead-colic, 1 acute pneumonia, 1 insanity, 2 alcoholismus, 1 perimetris, 2 severe asthma, 4 mercurial poisoning, 1 abdominal neuralgia. All of them had previously suffered from total or partial sleeplessness, and the majority had received opiates, among them hypodermic injections of morphine. The new soporific was usually administered in the evening at 9.30 p. m. The dose was:

8 times	0.1 gm.	(1½ grs.)	1 time,	0.45 gm.	(7 grs.)
4 "	0.15 "	(2½ ")	3 times,	0.5 "	(8 ")
10 "	0.2 "	(3 ")	1 time,	0.6 "	(9 ")
7 "	0.25 "	(3¾ ")	1 "	0.75 "	(12 ")
29 "	0.3 "	(4½ ")	1 "	1.0 "	(15 ")
5 "	0.35 "	(5½ ")	1 "	1.5 "	(23 ")
2 "	0.4 "	(6 ")			

according to the degree of wakefulness. Good results were obtained in thirty-seven cases, in which the patients fell asleep within half an hour or one hour, and slept calmly during the whole night, with at most but trifling interruptions. Partial success resulted in fifteen cases. In twelve cases no results were obtained. The sleep secured by the drug was usually very quiet, and not followed by toxic symptoms in the morning. In two cases only (after doses of 0.2 and 0.35 gm.) was there observed oppression of the head in the morning, and in three cases (doses: 0.3, 0.45 and 0.5 gm.) this was combined with dizziness. In a single case of lead-colic, in which the author had administered, on the previous evening, 0.75 gm. without effect, a dose of 1.5 gm. produced a strong stupor, followed by continuous sleep for three hours, and a cessation of pain on waking; next morning there were symptoms of narcosis, which, however, soon yielded to the external use of acetic ether. Vomiting was never noticed, nor were the bowels constipated, which is so commonly the case after the administration of morphine. No special observations were made on pulse or change of temperature.

From these sixty-three cases the author concludes that the tannate of cannabine is a "prominent hypnotic," which combines vigor and gentleness, is harmless in use, does not interfere with the secretions, and, if properly administered, produces no toxic symptoms. It is likely to be a frequent competitor of morphine.—New Rem., Feb. 1883, 40, from Memorabilien; Aerztliches Intelligenzblatt.

Calcatripine.—A new alkaloid from *Delphinium Consolida*, Lin., which see under "Materia Medica."

Urea—Detection by Means of Oxalic Acid.—According to E. Brücke, the detection of urea may be very accurately effected if this body is finally taken up with amylic alcohol, and precipitated by a solution of oxalic acid in amylic alcohol. The crystals of oxalate of urea are usually small, but are better developed when the entire liquid is warmed until the crystals have dissolved and then allowed to cool. The amylic alcohol solution which is to be tested for urea, may also be precipitated by a solution of oxalic acid in anhydrous ether. This latter mode of procedure would be adapted to its quantitative estimation, as the separation of the oxalate of urea proceeds very rapidly.—Amer. Jour. Phar, May 1883, 264, from C.Bl. Med. Wis. 1883, 139, through Chem. Ztg., No. 26, 1883, 393.

New Ureometer.—Mr. Dannecy describes a new ureometer, which may also be used for the estimation of nitrogen in most nitrogenized compounds.

It consists of a glass tube, closed at one end, having an interior diameter of 3 centimeters, and a total length of 50 cm. 10 cm. below its orifice, it expands into a bulb, which the author called "mélangeur" (mixer), and 2 cm. below this begins a scale in centimeters and one-tenths graduated on the tube. The orifice of the tube is closed by a rubber stopper carrying a perfectly air-tight glass faucet.

A trial experiment to test the accuracy of the apparatus, and of the graduation, may be performed by means of a standard solution of sulphate of ammonium, containing 0.1 gm. of the salt in 5 cc. of solution.

At first, 10 or 12 cm. of a solution of hypobromite of sodium are introduced into the graduated tube by means of a funnel having a long tube; on top of this solution is cautiously poured, without shaking or causing the liquids to mix, some distilled water, in several small successive portions, until it has reached the mark of the division at 5 cm. On top of this is then added 5 cm. of the standard solution of sulphate of ammonium. The rubber cork is next inserted while the faucet is open, and the latter then immediately closed. The whole apparatus is now inverted, and the contents shaken up four or five times—the stopper and faucet being held downwards. Whenever the liquid becomes clear, and is still slightly colored yellow, it may be presumed that all the gas has been separated, and that there still exists an excess of hypobromite of sodium, which is essential to the success of the experiment.

The faucet is now carefully opened, while the tube is still held upside down, whereupon the excess of liquid is pressed out by the gas. [The original fails to state that the faucet should be opened under the water; but this appears to be necessary.] The level of the liquid then indicates, in cc., the volume of the gas at the particular temperature and pressure at which the experiment is made.

From these statements it follows, that any nitrogenized organic matter may be assayed by the above process, if a weighed quantity of it be heated with soda-lime, and the generated ammonia then conducted into diluted sulphuric acid. This solution is then decomposed by the hypobromite.

Supposing we had obtained with 5 cm. of the normal ammonical solution, 18 cm. of gas, and with an unknown solution 22 cm. As we know that 0.1 gm. of sulphate of ammonium at 0°C. and at a pressure of 760 mm. furnishes 16.8 cc. of nitrogen; we have the following equation:

$$16.8 : 18 = 22 : x.$$
$$x = 25.5.$$

Now, as 1 liter of nitrogen weighs 1.26 gm., the 25.5 cc. weigh 0.0296 gm., and this is the weight of the nitrogen contained in the substance.—New Rem., Mar. 1883, 77, from L'Union Pharm., Nov. 1882.

Putrefaction Alkaloids—New Researches.—According to Mr. L. Brieger, if pepton, which has been obtained from fibrin by the action of the gastric juice, and free from putrefaction products (indol, phenols, oxyacids), is evaporated, extracted with boiling alcohol, and the residue remaining after the evaporation of the alcohol taken up with pure hot amylic alcohol, filtered and evaporated, there remains an amorphous mass, which possesses strongly poisonous properties. The substance is readily soluble in water, but insoluble in ether, benzol and chloroform. The aqueous soluion affords a white precipitate with phospho-molybdic and phospho-wolframic acids, a yellow precipitate with potassio-cadmic and potassio-mercuric iodides, and a red precipitate with cadmium-bismuth iodide. Auric and mercuric chlorides also produce precipitates in the solution, but not platinic chloride. Iodine solutions give brown precipitates, tannin colors the solution brown, ferricyanide of potassium and ferric chloride blue. The white precipitate obtained by Millon's reagent becomes intensely red on boiling. The toxic subcutaneous dose of the evaporated extract is for frogs 0.05 to 0.1 gm., and for small rabbits 0.5 to 1 gm., death being preceded by a condition of paralysis and drowsiness. The poisonous substance was also prepared once from Witte's dry pepton, but subsequently its preparation from this pepton was no longer successful, and it was confirmed that also this pepton possessed of itself absolutely no poisonous properties, although by the renewed action of artificial gastric juice it afforded small amounts of the poison. The same toxic substance may be prepared from putrefied albuminous bodies, such as fibrin, casein, the brain, liver, and muscle flesh. The poisonous substance which has recently been repeatedly observed in urine, the author believes to be identical with that obtained from pepton.—Amer. Jour. Phar., June 1883, 300, from Ber. d. Deutsch. Chem. Ges. 16, 807.

Ptomaine—Presence in Castor, which see under "Materia Medica."

Aniline—Preparation.—Arau proposes heating a mixture of carbon bisulphide 1 part and ammonia 2 parts to 50° C.; then binitrobenzol is added, and the gas generated is conducted into another vessel containing binitrobenzol; or the vapors given off from the above mixture at 50° C. are conducted through several vessels containing binitrobenzol until this is completely reduced to aniline. The wash-water contains ammonium sulphocyanide, and may be utilized for obtaining the potassium salt.—Amer. Jour. Phar., Sept. 1882, 435, through Chem. Zeitung, 1882, No. 30, p. 585, from Monit. Prod. Chim., xii. 145.

Methyl Orange—Value as an Indicator of Free Acid.—The proposition of Lunge (see Proceedings, 1882, 442), to use methyl orange as an indicator in alkalimetry may, according to B. S. Proctor, be extended to determining the presence or absence of free acids in salts, which in their normal condition have an acid reaction with litmus. One grain of the dye in a pound of water makes an orange-yellow test liquid, two or three drops of which added to one ounce of water give it a yellow tint, which is changed to pink by very small traces of free mineral acid. It is not so sensitive to oxalic acid, still less so to acetic, and not at all affected by carbolic acid. The action of tartaric and citric acids, though not so sharp as that of the mineral acids, is as clear as with most of the indicators in use. Normal ferrous sulphate does not color the yellow liquor pink; but the presence of even a trace of free acid at once produces a pink color. The same is true of sulphate of zinc, alum, etc. Arsenious or hydrocyanic acid has no action; nor is the test liquor affected by superphosphate of lime, unless there is more phosphoric acid present than is necessary to hold the lime in solution.—Yearbook of Pharm., 1882, 506–507.

Fuchsine—Detection in Red Wines, which see under "Materia Medica."

Fuchsine—A New Test for Ammonia, which see under "Inorganic Chemistry.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Asparagin—Presence in Leaf Buds.—The presence of asparagin in leaf buds was announced by J. Borodin ("Bot. Zeitung," 1878, p. 802), and has been verified by E. Schulze and J. Barbieri, who found it in the extracts obtained from the young leaves of birch, horse chestnut and plane trees; the latter yielded also .5 to 1 per cent. of *allantoin*, calculated for the dry leaves; but urea could not be detected. The horse chestnut leaves contained, besides a small quantity of asparagin, also *leucine.*—Amer. Jour. Phar., Dec. 1882, 626, from Jour. Prakt. Chem., xxv., 145–158.

Asparagin—Separation from Solutions.—A precipitate of asparagin has heretofore remained unknown. E. Schulze now recommends as such mercuric nitrate. By the decomposition of the white precipitate so obtained by hydrogen sulphide, the asparagin can again be obtained. This reaction may also be utilized for the separation of asparagin from plant extracts.—Amer. Jour. Phar., April 1883, 193, through Chem. Ztg., No. 82, p. 1441, from Ber. der Deutsch. Chem. Ges., 15, p. 2837.

Æsculin—Presence in the Root of Gelsemium Sempervirens and Physiological Action.—Dr. Edward Schwartz, operating by the method of Dragendorff for the separation of *gelsemic acid* (which see under "Organic Acids"), obtained a substance, the larger part of which had all the characters of æsculin. Physiological experiments made with æsculin (not with the similar principle obtained from gelsemium), lead him to the conclusion that:

1. Æsculin is without decided action upon the animal organism.
2. It rapidly enters the second ways from the stomach and intestines.
3. It is not decomposed within the body; and
4. Is rapidly excreted through the kidneys.
5. A prolonged time is required for its complete excretion.
6. Powdered æsculin is partly eliminated with the fæces, probably owing to its sparing solubility.

—Amer. Jour. Phar., Aug. 1882, 389–394.

Aesculin—Distinction from *gelsemic acid*, which see under "Oganic Acids."

Digitalin Group of Proximate Principles—Researches.—O. Schmiedeberg has separated from oleander leaves from Tunis, as active constituents, the so-called

Neriantin, or oleander-digitalin, and

Oleandrin.—The latter possesses all the properties which characterize the digitalin group, while neriantin is to be regarded as a glucoside, and has only a feeble action. The author has furthermore isolated from the North American *Apocynum cannabinum*, L., two substances which belong to the digitalin group, namely:

Apocynin, and

Apocynëin.—The former has a violent action, similar to oleandrin, while the latter is a glucoside, and of much more feeble action.—Amer. Jour. Pharm., April 1883, from Centralblatt für Med. Wiss., 1882, 929, through Chem. Ztg., No. 14, 204.

Convallamarin — Preparation.— Referring to the recent papers of Messrs. Sée and Langlebert (see "*Convallaria majalis*" under Materia Medica), Mr. Tanret observes that it seems important to experiment with the active principle rather than with extracts or other preparations liable to vary according to the condition of the plant from which they are prepared. He finds that Walz's method gives a satisfactory product, but is inconvenient, and he has therefore modified it in the following manner: An alcoholic tincture made from the whole plant is precipitated with subacetate of lead and filtered; the excess of lead is removed with dilute sulphuric acid, avoiding the use of more than is necessary, and after neutralizing, the tincture is distilled, the last portion of alcohol being driven off in the open air; then the cooled and filtered liquor is treated with tannin, care being taken to keep the liquid neutral by sparing addition of a dilute solution of carbonate of soda. A compound of tannin and convallamarin is precipitated, which, after washing, is dissolved in 60° alcohol, the solution decolorized with charcoal, decomposed with oxide of zinc, filtered and evaporated to dryness. In this way convallamarin is obtained nearly white, and having the appearance of ordinary digitalin. To free it from the salts that are sometimes carried down by the tannin precipitate, it is a good plan to redissolve it in 90° alcohol, filter and then evaporate. 1 kilogram of the fresh plant collected in the first days of August yielded 2 grams of convallamarin.—Phar. Jour. Tran., Nov. 25, 1882, 423–424, from Jour. de Pharm. (6) iii. 355, and Bull. Gén. de Thérap.

Quassin—Preparation and Character.—A. Christensen has prepared quassin both from Jamaica (*Picraena excelsa*) and Surinam (*Quassia amara*) quassia wood, and finds the yield to be fully as large from the former as from the latter. He has also met with rasped quassia wood from both sources, which contained no quassin at all. He cannot account for this absence of bitter principle, since both woods yielded comparatively considerable quantities of extract, viz., 2.8 and 2.6 % respectively, whilst good wood of *Picraena excelsa*, from which 0.06 % of quassin had been obtained, yielded 3.2 % of extract to hot water. The quassin was obtained in a pure crystalline condition, as follows:

5 kilos quassia wood was extracted by boiling with water for several hours twice successively. The united liquids were concentrated to 1½ liter, allowed to cool, filtered, and precipitated with tannic acid, observing to keep the mixture by the addition of carbonate of sodium neutral, or faintly acid only, since the tannate formed is very soluble in tannic acid solution. The addition of a pure washed pipe-clay facilitates the separa-

tion on filtration of the precipitate. The precipitate, having been repeatedly washed, is mixed with a large quantity of freshly precipitated carbonate of lead, and evaporated on the water bath, in small portions at a time, to dryness. The residue is exhausted 4 times with alcohol, the alcohol is distilled off, the residual liquid concentrated, and set asde to crystallize. The crystals are washed, dried between filtering paper, and finally recrystallized from æther-alcohol and water. When pure, quassin forms very thin rectangular scales, which are double refracting. It is odorless, intensely bitter, and forms permanent and neutral solutions in water, alcohol, etc. Shaken with water at the ordinary temperature for several days, 1 part is retained by 1230 parts, whilst a warm saturated solution, allowed to cool and maintained at the same temperature (15°C) during that time will retain 1 part in 735 parts. It is readily soluble in boiling alkalies, and is precipitated from such solution unchanged on the addition of acids. It is very readily dissolved by boiling alcohol, but requires 30 parts of 84 % alcohol at a temperature of 15°C. 1 part of quassin is soluble in 2.1 parts of chloroform. In ether and petroleum ether it is sparingly soluble. Its composition corresponds to the formula $C_{31}H_{42}O_9$. It is not a glucoside ; yet, when boiled with 3 % hydrochloric or sulphuric acid, the liquid on addition of water separates a white precipitate, which is but feebly bitter, and crystallizes in fine needles. Its composition is $C_{31}H_{38}O_9$, and it contains 11.5 % (about 4 mol.) of water of crystallization. The new body is very sparingly soluble in water, requires 180 parts of alcohol at 15°C. for solution, and is not precipitable by tannic acid.—Arch. d. Pharm., July 1882, 481–492.

Quassin—Physiological Action.—Dr. Comparden finds that quassin, the active principle as Quassia amara, in moderate dose, produces an increase in the salivary, hepatic and renal secretions, and acts as a stimulant to the muscular fibre of organic life. In doses of 15 milligrams to 15 centigrams, it causes in man a burning pain in the œsophagus, headache, nausea, vertigo, dimness of vision, vomiting and diarrhœa, and cramps of the muscles of the leg. These symptoms are removed by chloral or chloroform.—Amer. Jour. Phar., April 1883, 199, from Bull. Gén. de Thér.; Phila. Med. News.

Colocynthin—Preparation and Character.—Gustav Henke reviews the various methods adopted by earlier chemists, Meissner, Braconnot, Vauquelin, Labourdais, Herberger, Bastick, Hübschmann, and Walz, for the obtainment of colocynthin, or the various impure products which have received this name, and subsequently describes the process followed by him, and the true characters of the colocynthin obtained.

Five kilograms of commercial colocynth, deprived of the seeds, were reduced to coarse powder, and extracted four times with alcohol, diluted with an equal weight of water, with the aid of heat. The filtrates were combined, the alcohol distilled off, and the residue extracted with water and filtered. To the clear, bright yellow filtrate a concentrated aqueous solution of tannic acid was added, and the very abundant white precipitate thus formed allowed to deposit. As this required some time, its deposition was accelerated by the addition of powdered pumice-stone, thereupon the precipitate filtered, well washed, and, after mixing with freshly precipitated carbonate of lead, evaporated on a water-bath to dryness. Upon treating with boiling absolute alcohol the colocynthin becomes immediately dissolved; and, after evaporation and drying over sulphuric acid, forms a brittle, colophonium-like mass. When triturated, it forms a permanent, loose, and bright yellow powder.

Colocynthin is without action upon litmus, and is soluble in 20 parts of cold, or 16 parts of warm water; it is likewise very readily soluble in alcohol, but more difficultly in absolute alcohol. If to the alcoholic solution an excess of ether be added, the colocynthin separates out in the form of white flakes. It is insoluble in chloroform, ether, benzol, carbon bisulphide, and petroleum ether. When heated on platinum-foil it burns away without residue. Besides being soluble in water and in alcohol, it is also very readily dissolved by ammonia-water and an aqueous solution of chromic acid. Concentrated sulphuric acid dissolves it in the cold, forming a deep red liquid, and, upon warming, the colocynthin is immediately destroyed; dilute sulphuric acid is without any action. Concentrated nitric acid dissolves it in the cold with a bright red color, becoming somewhat darker in warming; dilute nitric acid shows the same behavior, but is much slower in its action. With concentrated hydrochloric acid it forms, even in the cold, a bright yellow liquid, which upon boiling becomes decomposed with the separation of a smeary, dark-gray substance; dilute hydrochloric acid dissolves it only by the aid of heat. It is slowly dissolved by fresh chlorine-water, as also by solutions of potassium or sodium hydrate, especially on boiling. The aqueous solution of colocynthin is completely precipitated by tannic acid, with the formation of a very abundant white, flocculent precipitate; acetate of lead produces only a very slight white turbidity. The solution in water is not affected by basic acetate of lead, ferric chloride, argentic nitrate, lime-water, ferrous sulphate, potassium ferrocyanide, mercuric chloride, ammonia, and the alkalies.

When heated with caustic alkali it develops no vapors of ammonia, and therefore contains no nitrogen. The aqueous solution of colocynthin quickly reduces Fehling's solution; if to the aqueous solution a few drops of sulphuric acid be added, a slight turbidity ensues.

Although Walz is stated to have obtained colocynthin in a crystalline form, the experiments of the author upon the colocynthin of his own preparation, as also with that of Walz, Bastick and Hübschmann, afforded only negative results; it always remained as a smeary mass, becoming brittle upon complete drying. The author furthermore considers the statement of the decomposition of colocynthin into cane-sugar and colocynthein by the action of concentrated sulphuric or hydrochloric acid, to be very improbable.

The entire yield of pure colocynthin from 5 kilograms of colocynth amounted to scarcely 30 gms. The statement of Walz to have obtained about 2 per cent. is thus also not confirmed.—Amer. Jour. Phar., June 1883, 301, from Arch. Phar., 1883, 200–205.

Jaffarabad Aloin.—Relation to other Aloins. See *Liliaceæ*, under "Materia Medica."

Picrotoxin—Separation from its Solutions as an Insoluble Salt.—R. Palm finds picrotoxin to be completely precipitated from its solution by ammoniacal basic lead acetate. By the decomposition of the lead precipitate, suspended in water, by means of hydrogen sulphide, and washing the lead sulphide with ammoniacal water until the latter no longer tastes bitter, a solution of picrotoxin is obtained, from which, after the evaporation of the solvent, it may be obtained in a crystalline form. This deportment of picrotoxin to basic lead acetate is considered of value for its separation from beer, or in forsenic investigations.—Ber. der Deutsch. Ch. Ges., No 16, 1882, p, 2758, from Rep. für. Analyt. Chem., 1882, pp. 265–267, in Amer. Jour. Phar., Feb. 1883, 91.

Piperine—Artificial Production.—Rügheimer describes the successful attempt to build up the alkaloid piperine by the same methods as those adopted by Ladenburg in the preparation of artificial atropine. The action of phosphorus pentachloride upon piperic acid yielded the acid chloride, which was then made to act upon piperidine. The result of the reaction, freed from side products, was piperine, which, after purification by recrystallization from benzol and ligroin, fused at 127 to 128° C., and gave figures on analysis closely according with those demanded by the formula. Natural piperine, according to Rügheimer's observation, fuses at 128 to 129.5° C. In some text books the fusing point of piperine is erroneously given on Pelletier's authority at 100 to 110° C.—Am. Jour. Phar., Aug. 1882, 397, from Ber. d. d. Chem. Ges., xv., 1390.

Laserpitin—Isolation and Character.—According to Dr. Richard Külz, laserpitin, the bitter principle of the white gentian root (*Laserpitium latifolium*), is obtained by repeatedly extracting the finely divided root with petroleum ether, the filtered liquids concentrated by distillation, and the residual red-brown liquid allowed to evaporate and crystallize. The crystals are purified by recrystallization from boiling petroleum ether, and then form large colorless crystals of the monoclinic system, having the composition $C_{15}H_{22}O_4$, and melting at 118° C.

Upon heating laserpitin with sodium acetate and an excess of acetic anhydride, the acetyl derivative, $C_{15}H_{21}(C_2H_3O)O_4$, is obtained, which crystallizes in short, thick, colorless needles, melting at 113° C.

By the action of KOH, laserpitin is split into laserol and angelic acid. The former could be obtained only as a brown resinous mass; the decomposition is presumed to occur according to the equation:

$$2C_{15}H_{22}O_4 + H_2O = C_{20}H_{30}O_5 + 2C_5H_8O_2.$$

—Amer. Jour. Phar., June 1883, 298, from Arch. Phar., 21, 161, through Chem. Ztg., 1883, 455.

Helenin—A Possible Poison for Tubercular Bacteria.—Experiments made by Mr. De Korab seem to indicate that *helenin* (from elecampane) is a possible poison to the bacteria of tuberculosis. Serum, in which the bacilli were cultivated, became inactive in the presence of helenin, after a certain exposure, while the serum, not containing helenin, retained its activity under the same conditions.—New Rem., Dec. 1882, 363.

Cholesterin—Occurrence in Plants.—Cholesterin in plants was first discovered by Beneke in 1862, and his observation was confirmed by Hoppe-Seyler, Hesse and others. E. Schulze and J. Barbieri have isolated from Lupinus luteus, *Lin.*, two modifications of cholesterin, one from the cotyledons, the other from the shoots, which they propose to call *caulosterin.* The following varieties of cholesterin have thus far been described: 1. Ordinary cholesterin, melting point 145° to 146° C.; 2. Phytosterin (O. Hesse), m. p. 132° to 133°; 3. Paracholesterin (Reinke and Rodewald), m. p. 134° to 134.5°; 4. Caulosterin, m. p. 158° to 159° C., and 5. Isocholesterin, m. p. 138° to 138.5°. All except the latter are lævorotatory, and give the characteristic color reaction with chloroform and sulphuric acid.—Amer. Jour. Phar., Dec. 1882, 626, from Jour. Prakt. Chem., xxv., 159–180.

Buxine,

Parabuxin, and

Buxeine (?).—Characters and and extraction from *Buxus sempervirens,* which see under "Materia Medica."

Andromedin (*Asebotoxin* of Eijkman ?).—Isolation and character. See *Andromeda japonica,* Thunberg, under "Materia Medica."

Asebotin, a new glucoside from *Andromeda japonica,* Thunberg, which see under "Materia Medica."

Adonidin.—A new glucoside from *Adonis vernalis,* which see under "Materia Medica."

Globularin.—A glucoside from the leaves of "*Globularia Alypum,*" which see under "Materia Medica."

Megarrhizin,

Megarrhizëin, and

Megarrhin.—Character, etc. See *Megarrhiza californica,* Torrey, under "Materia Medica."

Amargosin.—A bitter principle from *Castela Nicholsoni*, which see under "Materia Medica."

COLORING MATTERS.

Vegetable Coloring Matter.—Destruction by *Sulphuretted Hydrogen*, which see under "Inorganic Chemistry."

Coloring Matter.—Detection in Red Wines, which see under "Materia Medica."

New Coloring Matter for Wines, Liquors, Etc.—The following review of recent experiments and observations on the nature of certain new coloring matters is quite interesting:

A liquid for coloring wines red has lately been manufactured and sold in France and elsewhere, under the name "*Teinte bordelaise.*" It is stated by the manufacturers to impart the proper purple tint (of Bordeaux), as well as mellowness, bouquet, and the reaction of tannin. According to Carl Amthor, it is simply inspissated currant-juice containing about 4 per cent. of alcohol.

Under the name "*Rouge Végétal*" a red coloring matter for wines has lately been reintroduced. This may be recognized and distinguished from fuchsin in the following manner:

100 cc. of the suspected wine are freed from alcohol by distillation, the residue is strongly acidulated with sulphuric acid and then shaken with ether. The ethereal solution is then evaporated in a small capsule, in which a white woollen thread is placed. If "rouge végétal" was present, the thread assumes a brick-red color, which is colored transiently violet by ammonia, and afterwards assumes a dirty tint, If acetic ether is used, in place of ether, the thread becomes rose-red, which is changed to violet by ammonia.

Or, 100 cc. of the wine are shaken with amylic alcohol, which becomes red if fuchsin or "rouge végétal" are present. This red solution gives the following reactions:

In presence of *fuchsin*, the red solution becomes entirely colorless when warmed with ammonia; on the addition of acetic acid, the red color reappears.

In presence of "*rouge végétal*," addition of ammonia turns the red solution temporarily violet. By gently heating and shaking, the ammonia withdraws the color from the amylic alcohol, and assumes itself a dark-brown to dark fiery-red color. If acetic acid be now added, the color disappears almost entirely.

Under the name "*Substitute for Saffron*" ("Safran Surrogat"), a yellow coal-tar color has been sold for a number of years, which is used for imparting a yellow color to liquors, confectionery, maccaroni, etc., and has always been considered innocuous. A mixture of this with indigo-carmine is used for coloring liquors *green*, and is sold under the name of

"*Emerald-green*" (Smaragd grün). A mixture with aniline red is sold as "*Substitute for Carmine*" ("Carmin-Surrogat"). The "*Substitute for Saffron*," which was first prepared and sold by Mittenzwei in Pölbitz near Zwickau (Saxony), is now generally prepared by converting cresol into cresol-sulphonic acid, and cautiously nitrifying the latter. The generated nitro-acid, after being washed, is then converted into a potassium salt. G. Heppe has examined a number of samples of this coloring matter, and has found that while the pure potassium salt of the acid is *explosive*, the commercial salt is *not* so, because it is mixed with a certain proportion of chloride of ammonium, up to 40 per cent. the presence of which makes it non-explosive.

This substitute for saffron may be adulterated with picric acid. This may be discovered by dissolving the coloring matter in water, separating the nitro-cresylic acid with hydrochloric or nitric acid, filtering through a moistened filter and testing the acid filtrate in the usual manner for picric acid. If the latter is present, the filtrate has a more or less deep greenish-yellow color and an intensely bitter taste.—New Rem., May 1883, 148, from Rep. der Anal. Chem., 1882, No. 24.

Hæmateïn and Brazileïn—New Compounds.—Hummel and Perkin have studied purified hæmateïn and brazileïn, and have obtained some new coloring derivatives from them by the action of sulphuric, hydrochloric, and hydrobromic acids. They first obtained pure hæmateïn in glittering crystals of the formula $C_{16}H_{12}O_6$. They found it sparingly soluble in water, alcohol, ether and acetic acid; readily soluble in alkalies. It is destroyed by hot sulphuric acid, but dissolves readily in cold concentrated sulphuric acid, producing a dark reddish-brown solution. By adding hot glacial acetic acid very gradually to this solution, until it is diluted to two or three times its bulk, an orange crystalline precipitate is thrown down. This has the formula $C_{16}H_{12}O_6SO_3$, and is called by the authors sulphate of hæmatyl. By the action of hydrochloric acid, in sealed tubes, on hæmateïn, a body was prepared of the formula $C_{16}H_{11}O_5Cl$, crystallizing in scarlet needles. A similar compound, containing bromine, was prepared by the action of hydrobromic acid.

Brazileïn, as purified and dried at 100°C., had the formula $C_{16}H_{12}O_5$. H_2O, and yielded sililar compounds by action of sulphuric, hydrochloric, and hydrobromic acids. The tinctorial power of these new compounds is much greater than that of the original hæmateïn and brazileïn, and the colors are much faster. The authors consider that hæmateïn probably belongs to the class of phthaleïns.—Amer. Jour. Phar., Aug. 1882, 398, from Chem. News, June 23, 1882, p. 274.

Litmus—True Coloring Matter.—M. Richter has made some experiments which lead him to the hypothesis that the original coloring matter of litmus is red, and that this is changed to blue by oxidation. He bases this hypothesis on the fact that perfectly pure and neutral monochromate of potassium reacts alkaline with litmus, and believes this to be due to the oxidyzing action of the chromic acid. Another proof that the blue is a compound derived from the red is already known. If blue litmus solution is preserved in a close bottle, the liquid loses its blue color and acquires a reddish tint. If poured on a plate, so that the air has everywhere access, the blue color is soon restored. The air exerts here, without doubt, an oxidyzing action, though less rapid and energetic than that of chromic acid.—New Rem., Aug. 1882, 249, from Zeitschr. f. Anal. Chem. and Chem. News.

Blue Color—Recognition.—The following is communicated in "Phar. Zeitung" (1882, 609), from Gem. Wochenschr.," and may be found a useful memorandum here: Indigo is decomposed by heat and decolorized by chlorine, hypochlorites and nitric acid. Prussian blue is decomposed by heat and yields a residue of ferric oxide; it is not affected by chlorine or hypochlorous acid, but is decolorized by potassa, the blue color being restored by acids. Logwood blue is changed to red on the addition of a little acid, and by heat is decomposed, giving a residue of alumina and cupric oxide. Ultramarin is not altered by heat, but at once decolorized by nitric acid. Saxony blue is decomposed by caustic alkali, but restored by an acid. In a mixture of Prussian and Saxony blue, the former is decomposed by chlorine or nitric acid, while the latter requires the action of potassa to produce the same effect.—Amer. Jour. Phar., Mar. 1883, 140.

ALBUMINOIDS.

Crystallized Albumin—Composition as Obtained from Hemp and Castor Oil Seeds.—Mr. H. Ritthausen has made various preparations of albumin from hemp seed, and subjected them to analysis; their composition showed them to be identical with the crystallized albumin previously obtained (see Proceedings, 1882, 449). The following is the mean result of the analyses of crystallized alburnin from hemp and ricinus seed:

	Hemp Seed.	*Ricinus Seed.*
C	50.98	50.88
H	6.92	6.98
N	18.73	18.58
S.	0.82	0.77
O	22.55	22.79

The samples of crystallized albumin, therefore, from the two sources show so close an agreement in composition that they may be assumed to be identical; this assumption is borne out by the resemblance in their crystalline form, and their behavior with reagents. They dissolve in tolerably concentrated glycerin to an opalescent liquid, and are not reprecipitated therefrom by addition of water, being in fact soluble in the latter when quite free from adhering chloride of sodium.

Crystallized Albumin from Pumpkin Seed.—Mr. Ritthausen also carefully analyzed this body, and found that, whether burnt with cupric oxide or chromate of lead, it always gave a higher percentage of carbon than in the case of albumin from hemp seed and castor oil seed, but in no case were Grübler's numbers obtained, the latter finding 1.8 per cent. of carbon and 0.2 per cent. of hydrogen more than Ritthausen, whose analyses agree very well with those of Barbieri's referring to amorphous albumin from pumpkin seeds.—Jour. Chem. Soc., Aug. 1882, 877, from Jour. pr. Chem.

Commercial Albumin—Characters, etc.—Mr. Alfred H. Allen contributes a paper on the preparation, characters and tests of purity of commercial albumin. He also communicates the following ash-determinations, made in his laboratory by Mr. J. C. Belcher:

			Sulphated Ash.
"No. 1" Egg Albumin			7.4 per cent.
"No. 2"	"	"	7.0 " "
"Refined" Blood Albumin			9.1 " "
"Prime"	"	"	8.5 " "
"No. 1"	"	"	9.2 " "
"No. 2"	"	"	8.9 " "
"No. 3"	"	"	9.7 " "
"Black"	"	"	6.2 " "

All the ashes were white, except that yielded by the black albumin, which gave a reddish ash, owing to the presence of blood-corpuscles in the original sample. Curiously enough, in this, the lowest grade of genuine albumin, the ash is less than in the better kinds.—New Rem., June 1883, 178, from the Analyst, 1882, 209.

Albumen—A New Clinical Test.—Ferrocyanic Pellets, made of sodic ferrocyanide and citric acid, are recommended by Dr. F. W. Pavy ("British Medical Journal") as a clinical test for albumen. The advantages they possess are that they are very soluble, are always ready for use, simply requiring to be crushed, which can readily be done with a coin from one's pocket, and requiring no heat. The test, he says, is so delicate that even when there is only a small amount of albumen present it is easily recognized. After crushing, the powder is put into a test-tube and the urine poured in to the height of about an inch, which will be all that is required. Phosphates, he says, do not interfere with the reaction, but if lithates are present, giving the urine a cloudy appearance, it must first be warmed. They can also be used after the manner of the nitric-acid test, by first dissolving the pellet in a little water and then allowing the urine to trickle down the side of the tube until a quantity about half an inch in height has been introduced, when the albumen will be more clearly shown than with the nitric acid.—Amer. Jour. Phar., April 1883, 200, from Weekly Med. Review, March 3, 1883.

Albuminate of Copper—Preparation and Characters.—Mr. F. Harnack obtained albuminate of copper by treating a neutral solution of egg-albumin with a solution of a simple copper salt as long as a precipitate was produced, then neutralizing the mixture with carbonate of sodium. The precipitate, which could be washed without decomposition, was of a clear blue-green color, and very bulky, soluble with difficulty in excess of albumen or of copper salt, but readily soluble in acids and alkalies, forming, with the latter, a deep violet colored solution. By careful neutralization, the compound could be again precipitated from the acid or alkaline solution, and this afforded a ready measure of purification. When so prepared, the compound contained either 1.35 or 2.64 per cent. Cu. The former figure agrees with Rose's for albuminate of copper, and the latter with other authorities, if 1 per cent. is deducted for ash. The author obtained, as the result of elementary analysis, the formulæ $C_{204}H_{320}N_{52}O_{66}S_2Cu$, and $C_{204}H_{318}N_{52}O_{66}S_2Cu_2$ for the two compounds respectively; 2 and four atoms of hydrogen respectively having been replaced by copper. How it is that under some circumstances one compound, and under others the other is formed, has not been determined.—Jour. Chem. Soc., July 1882, 747, from Zeitschr. f. Physiol. Chem., 5, 198–210.

Milk—Specific Gravity and Total Solids.—Mr. Henry Trimble gives the average of thirteen analyses of milk made during a period of 18 months, as follows: sp. gr. 1.030; total solids, 13.72 per cent. The extremes of sp. gr. were 1.024 and 1.034; of total solids 11.63 and 15.73. The percentage of fat was determined only in a few instances, and in these averaged 4.18 per cent.

The author draws attention in this connection to the results of 12,349 analyses of milk reported by Dr. Vieth before the Society of Public Analysts, of England, and of 900 analyses reported by Dr. W. D. Hogg, of Paris, which, together with Mr. Trimble's results, are tabulated below:

	Spec. Grav.	*Total Solids.*	*Fat.*	*Solids, not fat.*
Vieth	1.0319	13.03%	3.52%	9.51%
Hogg	1.033	13. %	4. %	9. %
Trimble	1.030	13.72%	4.18%	

The author is opposed to judging milk by spec. grav., since samples rich in fat my have correspondingly low specific gravities.—Amer. Jour. Phar., April 1883, 178.

Milk—Examination by the Aid of the Lactometer.—The presence of the fat in milk is liable to mislead when determining the value of milk by its sp. gr. Mr. Gustavus Pile, after trying to remove the fat by the aid of solvents (chloroform, bisulphide of carbon, ether, etc.), finds this not available, owing to the difficulty of their subsequent separation. He concludes that it is best to allow the cream to rise in the ordinary way, and then, after its removal, to take the sp. gr. of the skimmed milk. Assuming 14% as the normal quantity of solids in good skimmed milk, he has constructed the following table:

Specific Gravity	*Per cent. Solids.*	*Per cent. Water.*
1.0320	14.	0.
1.0297	13.	7.7
1.0291	12.7	10.
1.0280	12.	14.3
1.0267	11.6	20.
1.0251	11.	27.5
1.0246	10.8	30.
1.0229	10.	40.
1.0213	9.3	50.
1.0206	9.	55.5
1.0200	8.7	60.
1.0188	8.2	70.
1.0183	8.	75.
1.0178	7.7	80.
1.0168	7.3	90.
1.0160	7.	100.

In using the lactometer made according to this scale, it is first necessary to fill, with the milk to be tested, a jar graduated to indicate the percentage of cream, allow it to stand for a length of time sufficient for the cream to rise; this will be from six to eight hours, when a distinct demarcation will allow the percentage to be readily read off. By means of a pipette the cream is to be removed, and the lactometer floated in the milk, when the per cent. of solids can be seen without any further operation.—Amer. Jour. Phar., May 1883, 244–246.

Blue Milk—Origin and Prevention.—According to J. Reisset, the disease, which is presumed to be produced by bad ventilation, proceeds from a blue fungus, which attains a length of twenty millimeters, and may be suppressed by thorough purification of the vessels with boiling water, avoiding the use of brushes and cloths. Strongly infected milk is regenerated by acetic acid, to which purpose an acid consisting of one part of water to ten molecules $C_2H_4O_2$ is employed, and 0.5 gram of the acid added to one liter of milk.—Amer. Jour. Phar., May 1883, 265, from Compt. Rend., 96, 682, through Chem. Ztg., No. 26, 1883, 394.

Preserved Milk—Alteration.—Several years ago Naegeli observed that preserved milk, which has not been heated to a sufficiently high temperature, or not long enough, gradually acquires an intensely bitter taste, the casein at the same time being peptonized; he ascribed the change to the influence of schizomycetes ("Naegeli, Theorie der Gährung, p. 89"). Recently Meissl examined a milk ("Berichte, 1882, p. 1259"), which had been preserved by heating and keeping it in well-sealed bottles. After one year it had acquired a bitterish taste; the fat was somewhat rancid and bleached, the milk-sugar unaltered 4 to 5 per cent., albumen and casein were mostly peptonized, and minute quantities of leucin, tyrosin, and ammonia were found, together with traces of acids, the nature of which was not established; organized ferments could not be observed, and the changes were ascribed to the long-continued mutual action of the constituents upon one another.

C. Loew ("Berichte, 1882, p. 1482") states, that milk which has been heated for some time to 120°C. will keep for a number of years. But he examined a milk which had been kept for 8 years after having been heated to 101°C. for 40 minutes, and which was brownish, of a faint acid reaction, nearly inodorous, but intensely bitter. The milk-sugar had been completely transformed into lactose and glucose, and the casein and albumin into peptone, so that potassium ferrocyanide and acetic acid produced not even a turbidity, while tannin, alcohol, mercuric nitrate, and phosphotungstic acid gave bulky precipitates. A portion of the peptone had been converted into leucin, tyrosin, and ammonia, while a granular deposit, which was insoluble in boiling water and alcohol, appeared to be an anhydride of tyrosin.—Amer. Jour. Tharm., Feb. 1883, 101–102.

Milk—Detection of Salicylate of Sodium.—Girard mixes 1 liter of milk with 1 liter of warm water, then adds 5 drops of acetic acid, filters, and agitates the liquid with ½ liter of ether; the ether is then decanted, and allowed to evaporate spontaneously. If salicylic acid were present, the residue gives with one drop of a 1-per cent. solution of ferric chloride a violet coloration.—Chem. Ztg., 6, p. 385, from Giorn. Farm. Chim., 31, p. 124, in Amer. Jour. Phar., July 1882, 358.

Skim-milk—Value as Food.—Ritthausen regards skim-milk as a valuable food for man and beast, 2.8 liters of it containing as much nitrogenous matter as a pound of meat, and it is much cheaper. J. Stohmann has calculated that 1 liter skim-milk corresponds in nutritive value to 160 grams of boneless meat.

J. Koenig shows that skim-milk is by far the cheapest and most nutritious food for adults, and that the proportion of the cost of 1,000 nutritive units is 41.7 for skim-milk, 71.4 for pork, 81.7 for butter, and 201.2 for eggs.—Amer. Jour. Phar., Feb. 1883, 101, through Jour. Chem. Soc., 1883, p. 102; from Bied. Centr., 1882, p. 641, 693.

Condensed Whey—Utilization as a Food Product.—Professor Alexander Mueller draws attension to a new use to which the whey, accumulating as a by product of cheese factories, is being put. The whey contains about an equal quantity of milk-sugar and albumen, as well as a considerable quantity of salts and particles of caseine and butter-fat that have escaped being made into cheese. It is possible to condense the whey *in vacuo* so as to form a stiff dough, which hardens to a solid cake, and may be kept for months without spoiling or moulding. In this condition it is better for the preparation of milk-sugar than any other preparation, but its chief use is intended to be as a food product. In the household, it is capable of the greatest variety of uses for food and drink, and particularly for bread and pastry. A Mr. Bolle has successfully introduced different kinds of bread made with this condensed whey, such as whey rye bread, two kinds of wheat bread, and a fine article of rolls. —New Rem., Feb. 1883, 42, from Chemiker Zeitung and St. Louis Druggist.

Koumiss—Peptonization of Albuminoids During Fermentation.—A. Dochman has examined mare's milk during different stages of fermentation. In 1000 parts of fresh and fermented mare's milk were found:

		Fermented for		
	Fresh.	12 hours.	40 hours.	70 hours.
Casein	24.8	14.66	12.88	9.64
Albumin	——	3.02	2.03	1.20
Parapeptone-syntonin	——	4.88	8.40	6.88
Peptone	0.28	1.04	2.48	4.84

—New Rem., Jan. 1833, 20, from Biederm. Centr., 1882, 503.

Kefir—A New Milk Ferment.—A new drink, prepared from cow's milk by a process of fermentation imperfectly understood, is coming into use in Russia. This drink is "kefir," which has long formed the chief article of diet among the mountaineers in the neighborhood of Mount Elbruz and Kasbek, in the Caucasus. It forms a thick white fluid, with a faintly acid flavor, said to resemble light wines. The mountaineers themselves call it "ghippo." The inhabitants of the plains near the Caucasus, and the Russian settlers, who term it kefir, kifir, khiafar, make use of it, not for the table, but as a popular remedy for anæmia, struma, gastric catarrh, and chronic bronchitis. According to Dr. Kern (in *Moscow Gazette*), its preparation is very simple. The mountaineers make it by filling a bag made of goat skin with milk, then a tenacious mass, of the size of a walnut, of a material which they term "kefir seed," and the origin of which they cannot be persuaded to reveal, is added to the milk. In a few hours the process of fermentation sets in actively. When prepared in wooden or glass vessels the kefir tastes better. A weak kefir is produced after twenty-four hours, and after three days it becomes very strong. A fragment of the ferment, a dry, dark-brown, earth-like mass, when dropped into milk begins rapidly to effervesce, turns milk-white, and assumes the form of a mulberry, then fermentation sets in at once. If a piece, thus transformed, be dropped into another bowl of milk, it rapidly increases in size, and also causes fermentation. Dr. Kern has carefully examined specimens of this "kefir seed," which consists chiefly of masses of zooglæa, holding together collections of a bacterium, which he calls

Diospora Caucasica. The yeast fungus, *saccharomyces cerevisiæ*, is always found associated with this new germ. "Kefir-seed" retains its vitality after remaining for months in its dry condition. Dr. Kern has a great belief in the future of kefir, which has all the virtues of koumiss, and possesses one great advantage over the latter fluid, in that it is just as good when prepared from cow's as from mare's milk.—Phar. Jour. and Trans., June 30, 1883, 1082.

Digestive Ferments—Action upon Drugs.—Mr. George Brownen communicates some experiments made to determine the action of digestive ferments upon certain drugs—such as rhubarb, calumba, opium, cinchona, gum arabic, Iceland moss, Irish moss, etc., and certain chemicals—such as salicin, tannin, jalapin, santonin, etc. The ferments used were solutions of pepsin and of pancreatine, obtained from the stomach, and pancreas of the pig respectively. The experiments seem to show that some of these substances are acted upon decidedly by one or the other of these ferments, whilst other are not affected. The author's investigations open an interesting field for further study.—Yearbook of Pharm., 1882, 447-450.

Pepsin—Soluble and Insoluble Modifications.—Mr. A Gautier finds that solution of pepsin from the sheep, filtered twice through paper, and then through biscuit porcelain, though still retaining the property of rapidly dissolving fibrin, and converting it completely into peptone, has nevertheless only about one-half the digestive property of the unfiltered liquid. The portion left on the filter, after prolonged washing, consists mainly of rounded or ovoid refractive corpuscles, about one-tenth or one-twelfth the diameter of the globules of beer yeast. They have a somewhat slow, non-brownian motion, and are frequently associated in pairs, in which condition they appear to be more mobile. They are accompanied by numerous agglomerations of brilliant immobile corpuscles, together with crystals of phosphate of magnesium and ammonium, fatty globules, and here and there very small bacteria. This insoluble portion in presence of dilute hydrochloric acid, has a power of dissolving fibrin six times greater than that of the unfiltered pepsin, but the process of digestion is not complete, even after a long time, the fibrin being converted into intermediate products, which are precipitated by nitric acid. The insoluble particles are probably protoplasmic granules of the petogenic cells. In presence of pure water, they are slowly converted into soluble pepsin. Their action is not affected by considerable quantities of hydrocyanic acid.—Jour. Chem. Soc., July 1882, 752, from Compt. Rend., 94, 652-655.

In a further communication, Mr. Gautier observes that the gradual conversion of the insoluble into the soluble modification of pepsin, affords proof of Béchamp's supposition (Compt. Rend, 94, 582-585) that pepsin is a product of the gastric microzymas, as he terms the insoluble granules.

The author is, however, unable to agree with Béchamp that these granules are living organisms, which have the power of secreting pepsin. He regards them as a purely chemical ferment, without organization and without life, and bases his conclusion on the following facts: The granules show no signs of organized structure under the highest magnifying power; they do not propagate even under the most favorable conditions; they digest alluminoids in presence of poisons which completely check the activity of organized ferments, especially such as are of the nature of vibrioles, and they act only in presence of free acids, whereas bacteria and their germs require a neutral or alkaline medium. The insoluble granules can be easily obtained from the mucous membrane of a pig's stomach, from which all mucus has been removed. Thus obtained their properties agree with those of the *gastric microzymas* of Béchamp.—Jour. Chem. Soc., Aug. 1882, 877, from Compt. Rend., 94, 1192–1195.

Pepsin—Chemistry.—P. Chapoteaut has found that an aqueous solution of gastric juice, previously dried and washed with ether, yields a pulverulent white precipitate when mixed with its own volume of alcohol. Since alcohol modifies the precipitate, it is better to use sulphuric acid, or some other acid which does not dissolve the precipitate if added in excess; excess of hydrochloric acid readily dissolves it. This white precipitate constitutes the active part of the gastric juice. In presence of a small quantity of lactic acid, it converts beef fibrin into syntonin in five or six minutes, and into peptone if heated to 60°. A liter of water dissolves 2 grams at the ordinary temperature, and the aqueous solution is not coagulated at 100° C. At this temperature, however, the substance loses its fermentative power. The substance is soluble in alkalies, and is re-precipitated by acids, but gradually loses its active properties. It is also precipitated by lime, baryta, and basic lead acetate. It exerts no action on polarized light, and contains $C_{51}H_{7.2}N_{16.4}$ per cent. Its composition is, therefore, similar to that of the albuminoids. It may be regarded as true *pepsin*, and exists in the gastric juice in the form of a potassium salt, together with another albuminoid which does not dissolve blood-fibrin, and a fatty acid which cannot displace the pepsin from its combination with potassium.—New Rem., Jan. 1883, 22, from Comptes Rend., 94, 1722; 95–140.

Pepton.—Formation of Putrefaction Alkaloid. See "Organic Bases."

Pancreatin.—Effect on Cod Liver Oil. See *Misturæ*, under "Pharmacy."

Rennet.—Preparation of Essence.—See *Essence of Rennet* under "Liquores."

Vegetable Substitute for Rennet.—See *Tuneeria coagulans*, under "Materia Medica."

Glue—Addition of Glycerin.—A German chemist named Puscher, a native of Nuremberg, reported to the trades-union of that place that he met with great success in using glycerin together with glue. While generally, after the drying of the glue, the thing to which it is applied is liable to break, tear, or spring off, if a quantity of glycerin equal to a quarter of the quantity of glue be mixed together, that defect will entirely disappear. Puscher also made use of this glue for lining leather, for making globe-frames, and for smoothing parchment and chalk paper. He also used it for polishing, mixing wax with the glycerin, and using it as an underground for laying on aniline red color. The red was found to exceed all others in which glycerin is not used. The glycerin has also some properties in common with india-rubber, for it will blot out pencil-marks from paper, so as to leave no mark whatever. A paste made of starch, glycerin and gypsum, will maintain its plasticity and adhesiveness longer than any other cement, and therefore recommends itself for cementing chemical instruments and apparatus used by pharmacists.—New Rem., Feb. 1883, 56.

REPORTS OF COMMITTEES.

REPORT OF THE COMMITTEE ON THE DRUG MARKET.

BY GEORGE W. SLOAN, CHAIRMAN.

To the President and Members of the American Pharmaceutical Association.

The chairman of your committee on the Drug Market feels compelled to offer an apology to the association for the meagreness of the following report, consequent upon his unfitness for the position, for various reasons, the first of which is the lack of familiarity with the market consequent upon his residence at a remote point. and, secondly, the want of sufficient time to devote to such important work. While it is true a large portion of the work is necessarily one of compilation, nevertheless one who is upon the ground can glean information that is very difficult for one at a distance to collect.

In this connection I feel justified in offering the following quotations from President Proctor's address in 1863. Referring to this committee, he says: "The appropriate duties of this committee were not pointed out in the minute of its appointment. Its action may become exceedingly useful if rightly directed and perseveringly pursued ; or it may be productive of no good results. That success should attend it, *the chairman should be so situated near the foreign drug trade and manufacturing marts as to have the necessary opportunity through the entire year to get access to the facts*, and his coadjutors should be selected both by location and ability with a view to the work." The Italics are mine. See table, page 308.

TABULATED REPORT, ETC.

In reviewing the market we have given especial attention to a few articles, deeming it unnecessary to attempt to embrace the whole market. The tabulated price list which accompanies this report, constitutes the average monthly prices paid by retail pharmacists during the past year.

This plan has been adopted as more fitting to our association than one in which package prices alone are given. As there are various grades of many articles, the aim has been to describe the better grades in this table. We will endeavor to give a brief sketch of the trade by months, as follows.

September, 1882.—The market for this month was not very active, the

TABULATED REPORT OF THE DRUG MARKET BY MONTHS SEPTEMBER 1882 TO AUGUST 1883 INCLUSIVE.

		September	October	November	December	January	February	March	April	May	June	July	August
Acid, Carbolic, *Crystals*,	per lb.	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 55	$ 55	$ 35	$ 40	$ 40
Acid, Citric,	"	65	64	64	60	60	60	60	55	55	57	54	54
Acid, Salicylic,	"	1 75	1 65	1 65	1 60	1 60	1 60	1 55	1 55	1 55	1 85	1 75	1 85
Alcohol, 95%,	per gal.	2 25	2 30	2 30	2 30	2 30	2 30	2 25	2 25	2 25	2 25	2 25	2 25
Balsam Copaiba,	per lb.	65	60	60	60	60	60	60	55	55	55	55	55
Balsam Peru,	"	4 00	4 00	4 00	4 00	4 00	4 00	3 50	3 50	3 00	3 00	3 00	3 00
Balsam Tolu,	"	60	60	60	60	60	60	60	60	60	50	55	50
Bean, Vanilla, long,	"	11 00	10 00	10 00	10 00	10 00	10 00	10 00	10 00	10 00	10 00	10 00	10 00
Bean, Tonka,	"	1 80	1 40	1 40	1 40	1 40	1 40	1 40	1 40	1 40	1 50	1 60	1 90
Camphor,	"	26	26	26	26	25	25	25	25	25	25	25	25
Cantharides, sifted,	"	1 05	1 05	1 05	1 05	1 05	1 05	1 05	1 05	1 05	1 05	1 10	1 15
Chloral, Crystal,	"	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 80	1 75	1 70
Cinchonidine Sulph.,	per oz.	1 00	1 00	1 00	1 00	1 00	95	95	95	95	90	90	90
Cubebs,	per lb.	35	90	1 00	85	65	60	45	45	45	55	70	70
Ergot,	"	40	45	45	45	45	45	50	50	50	50	50	45
Chamomile, Roman,	"	18	28	28	60	45	45	35	30	30	40	40	40
Guarana,	"	1 10	1 10	1 80	1 25	1 25	1 40	1 65	1 85	1 85	1 75	2 00	3 00
Glycerin,	"	37	30	30	28	28	28	28	28	28	28	28	28
Gum Asafœtida,	"	24	27	28	28	28	28	30	30	30	30	30	30
Gum Arabic, select,	"	50	50	50	50	50	50	50	50	50	45	45	45
Gum Opium,	"	4 65	4 65	4 65	4 50	4 50	4 50	4 35	4 35	4 35	4 20	4 20	4 20
Hops,	"	50	55	1 00	1 25	1 10	1 10	90	90	90	90	85	40
Iodine,	"	2 90	2 75	2 75	2 75	2 75	2 65	2 65	2 65	2 65	2 60	2 60	2 60
Manna, large,	"	90	90	1 10	1 10	1 10	1 10	1 25	1 25	1 25	1 25	1 25	1 25
Morphine Sulph.,	per oz.	3 00	3 60	3 60	3 60	3 60	3 50	3 50	3 50	3 50	3 40	3 40	3 25
Nux Vomica,	per lb.	10	10	10	10	10	10	10	10	10	10	10	10
Oil Anise,	"	1 90	2 00	2 10	2 10	2 10	1 90	1 90	1 90	1 90	1 90	1 90	1 90
Oil, Castor,	"	1 15	1 15	1 15	1 20	1 25	1 25	1 25	1 25	1 25	1 20	1 20	1 30
Oil, Cod Liver Oil,	per gal.	1 05	1 85	1 85	1 85	1 85	1 85	1 75	1 75	1 75	1 75	1 75	1 75
Oil, Olive, Malaga,	"	1 15	1 15	1 15	1 15	1 15	1 15	1 15	1 15	1 15	1 10	1 10	1 00
Potassium, Iodide,	per lb.	1 75	1 75	1 75	1 75	1 75	1 45	1 45	1 45	1 45	1 45	1 45	1 45
Quinine, American,	per oz.	2 40	2 25	2 10	1 95	1 65	1 85	1 85	1 55	1 85	1 60	1 50	1 50
Quinine, German,	"	2 20	2 10	2 00	1 80	1 80	1 70	1 70	1 70	1 70	1 40	1 50	1 70
Quassia,	per lb.	5	5	5	20	8	8	8	8	8	6	6	
Root Gentian,	"	8	8	8	15	15	15	13	12	12	12	12	12
Root Hydrastis Can.,	"	45	30	30	20	20	33	33	33	33	30	30	30
Root Ipecac,	"	1 10	1 00	1 10	1 10	1 10	1 00	1 00	1 00	1 00	1 00	1 00	1 00
Root Jalap,	"	35	30	27	27	27	27	27	27	27	27	27	27
Seed, Cardamom,	"	3 25	3 25	2 75	2 50	2 50	1 75	1 75	1 75	1 75	1 75	1 75	1 75
Seed, Quince,	"	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 20	2 10	2 10
Soap, Castile, mottled,	"	9	9	9	9	9	9	9	9	9	9	9	9
Soap, Castile, white,	"	14½	14½	14½	14½	14½	14½	14½	14½	14½	14	14	14

warm weather continuing until late in the month, and seeming to check business somewhat. Some of the changes during the month are as follows:

Advanced.—Cubebs, cantharides, oil rose, alcohol, castor oil, balsam Peru, cod liver oil, oil sassafras.

Declined.—Opium, copaiba, oil bergamot, glycerin, sugar milk, quince seed.

OCTOBER, 1882.—The trade for this month was not satisfactory, it being the almost unaminous opinion of the members of the Drug Exchange of New York, that it was the dullest October for twenty-five years. Prices however were firm and profits small. The most important changes were:

Advanced.—Asafetida, cantharides, opium, licorice root, manna, golden seal, gentian root.

Declined.—Aloes, canary seed, quinine, ergot, arnica flowers, balsam copaiba, balsam tolu.

NOVEMBER, 1882.—This month was characterized by more animation than had prevailed for a long time. Quinine advanced in the first part of the month but receded again later. The demand both at home and abroad from brewers, for a substitute for hops, enhanced the value of quite a list of articles, among which are

Advanced.—Quassia chips, chamomile Roman, lupulin, nux vomica, gentian, columbo, chiretta.

Declined.—Asafetida, sugar lead, guarana, benzoin, gamboge, opium.

DECEMBER, 1882.—This month did not differ much from the usual December business; buyers did not seem disposed to increase their purchases at the close of the year, prices were merely nominal, and the changes in price were but few, among which may be named as follows:

Advanced.—Opium, beeswax, balsam copaiba, pareira brava.

Declined.—German quinine, ipecac, Roman chamomile, cubeb berries, oil sassafras.

JANUARY, 1883.—This month, while quiet during the first part, brightened very much toward the close. Quinine had its usual fluctuations of a few cents per ounce. Opium was not materially changed, while the manufacturers reduced the price of sulph. morphia to $3.50 per ounce. Hops rated as high as $1.02 per pound during this month. Among the changes were:

Advanced.—Balsam tolu, benzoin, castor oil, quicksilver, Roman chamomile, oil bergamot, oil wintergreen.

Declined.—Cinchonidine, balsam copaiba, cubebs, oil peppermint cassia, cloves, pepper, pimento.

FEBRUARY, 1883.—This month during the early part was quiet, and the cause was attributed to the inactivity of Congress, while later in the month the storms and floods in the Western States had an influence upon the trade. A few articles advanced, owing to their temporary scarcity, while others declined in the absence of any active demand.

Advanced.—Salicylic acid, canary seed, gum arabic, castile soap.

Declined.—Gentian, columbo, citric acid, opium, balsam tolu, cloves.

MARCH, 1883.—The market during this month was still in an unsettled condition, owing in a great measure to the tariff agitation, and the consequent changes in the same; the result was that buyers would only take such articles as they were in actual need of. The changes were few, among which were:

Advanced.—Cod-liver oil, gum arabic, Socotrine aloes, guarana, borax.

Declined.—Balsam tolu, citric acid, oil lemon, oil cubebs, oil bergamot.

APRIL, 1883.—This month gave evidence of a marked improvement, and while the demand for goods was more active, still prices made but few changes. There were but few advances, and the list of declines was much the larger. Quinine declined a little, opium made no change and was dull, cod liver oil advanced, as did serpentaria also, while copaiba, asafœtida and quicksilver declined.

MAY, 1883.—The most important event of this month was the auction sale of several parcels of quinine, amounting to upwards of 30,000 ounces, which ranged at prices varying from $1.31 to $1.61 per ounce for the foreign and domestic brands. Opium had a downward look, while the manufacturers reduced their prices upon morphia to $3.40 per ounce, and cinichonidia sulph. to 90 cents per ounce. There were no other changes of material importance.

JUNE, 1883.—This month being the closing one of the fiscal year, the consequent changes in the tariff at the beginning of the next month, had a tendency to depress the trade beyond necessary demands. Quinine advanced, and while a few other articles made small changes in that way, full as many declined. Opium remained quiet, and there was no change in morphine. Mercurials advanced, while citric acid declined.

JULY, 1883.—This month continued much as the previous had done—no excitement in anything—quite a number of articles went lower on account of the reduction of duties, and trade was held to be in a healthy condition. Morphine declined, quinine was steady, and there was nothing upon which to base an unusual demand, there being neither wars nor epidemics that would consume any great amount of the article, while throughout the Western States, those localities that formerly supplied the great demand during the months of August and September, have, in a great measure, cleared off the timber, and have ditched and drained the surface of the land to such an extent that the great scourge of a few years back, known as the fever and ague, has been reduced to a minimum of what it formerly was. Also a better system of quarantine upon our seaboard has undoubtedly kept back the yellow fever.

AUGUST, 1883.—As our report closes with this month, there is nothing of material interest to announce. The trade has been good through the month. Quinine has not changed, while opium has remained much as before; while the demand is good, the supply appears to equal it. The changes in prices were few, and the declines were pretty equally matched by the list of advances.

The last Congress repealed the stamp tax upon medicines, perfumes, and many other articles that are sold by druggists; and while as yet dealers have received but little benefit from said repeal, they are hopeful that the near future will increase their profits.

CHANGES IN THE RATES OF DUTIES ON DRUGS, CHEMICALS, ETC., UNDER THE NEW TARIFF, IN EFFECT JULY 1ST, 1883.

	New Rate.	Old Rate.
Acid, Acetic, over 1.047 . . lb.	10 c.	30 c.
" Not over 1.047 . . . lb.	2 c.	5 c.
" Chromic . . . . . . lb.	15%	15%
" Citric . . . . lb.	10 c.	10 c.
" Tannic . . . . lb.	$1 00	$1 00
" Tartaric . . . . . . lb.	10 c.	15 c.
" Boracic . . . . lb	4 c.	free
" " Pure . . . . lb.	5 c	"
" Muriatic . . . . lb.	free	"
Acids used for Chemical purposes	"	"
Acids Medicinal purposes . .	"	10%
" Manufacturing purposes	"	free
Aconite	"	"
Acorns . . . . lb.	2 c.	3 c.
Albumen	free	free
Alcohol, containing 94% Anhydrous Alcohol . proof gall.	$2 00	$2 00
Alcoholic Compounds, n. o. p. f. . . . . proof gall.	$2 & 25%	$2 00
Alcoholic Perfumery . . . gall.	$2 & 50%	$3 & 50%
Almonds . . . . lb.	5 c.	6 c.
" Shelled . . . . . . lb.	7½ c.	10 c.
Alum, all	60 c. 100lb.	60 c. 100lb.
Alumina and Sulphate of . .	60 c. 100lb.	60 c. 100lb.
Amber Gum	free	free
Ambergris	"	"
Ammonia Aqua, or Water . .	20%	40%
" Carbonate	20%	20%
" Muriate	10%	10%
" Sulphate of	20%	20%
Anatomical preparations. . .	free	free
Aniline, Arseniate of	"	"
Annatto	"	"
" All extracts of . . .	"	"
Antimony, regulus of	10%	10%
" Ore or Sulphide . .	free	free
Argol or Crude Tartar	"	"
Arrowroot	"	30%
Arsenic	"	free
Asafœtida	"	20%
Balm of Gilead	"	free
Balsam, Tolu	"	"
" Fir	"	"
" Peru	"	"
" Copaiba	"	"
" All medicinal *not* edible	"	30%

	New Rate.	Old Rate
Bark, Aconite	"	free
" Calisaya	"	"
" Canella Alba	"	"
" Cascarilla	"	"
" Cinchona	"	"
" Croton	"	"
" Hemlock	"	"
" Lima	"	"
" Peruvian	"	"
" Pomegranate	"	"
" Quillaia	"	"
" All medicinal and *not* edible, CRUDE	"	"
" All medicinal and *not* edible, *not* CRUDE	10%	"
Barley . . . . bush.	10 c.	15 c.
" Pearled . . . . lb.	½ c.	1 c.
" Patent or hulled . . lb.	½ c.	20%
Baryta, Carbonate of . . . lb.	free	½ c.
" Sulphate . . . . . lb	¼ c.	½ c.
Bay Rum, per proof gall . . .	$1 00	$1 00
Beans, St. John	free	free
" Tonka	"	"
" Vanilla	"	"
" Calabar	"	"
" St. Ignatius	"	"
" All Med., *not* edible, and in a crude state . .	"	"
" All Medicinal and *not* edible, *not* crude . . .	10%	"
Beeswax	20%	20%
Berries, Jujubæ	free	10%
" Huckle	10%	10%
" Juniper	free	free
" Medicinal and *not* edible, crude	"	"
" Medicinal and *not* edible, *not* crude	10%	"
Bismuth	free	"
Bitumen, CRUDE	"	20%
Blacking	25%	30%
Bleaching Powder	free	free
Borax, crude . . . . lb.	3 c.	"
" Refined . . . . lb.	5 c.	10 c.
Brazil Nuts	free	free
" Paste	"	"
Brimstone	"	"
" In rolls or refined ton.	$10 00	$10 00

	New Rate	Old Rate
Bromine	free	free
Bronze Powder, in leaf	10%	10%
" In powder	1[illegible]	[illegible]
Brushes	[illegible]	40%
Buds, med., *not* edible, *crude*	free	free
" med., *not* edible, *not* crude	[illegible]	"
Burnt Starch . . . lb.	1 c.	1[illegible]
Cadmium	free	free
Calamine	"	"
Camphor, crude	"	"
" Refined . . . lb.	5 c.	5 c.
Card Cases	[illegible]	35%
Cassia . . . lb.	free	10 c.
" Buds	free	20 c.
Cassia Vera . . . lb.	free	10 c.
" Ground . . . lb.	1[illegible]	20 c.
Castor	free	free
" Beans or seeds . . bush.	50 c.	60 c.
" Oil . . . gall	80 c.	$1 [illegible]
Cerium	free	free
Chalk, Prepared	20%	[illegible]
" French	20%	[illegible]
" Red	20%	[illegible]
" White	20%	free
" Unmanufactured	free	25%
Chemical compounds and Salts, n. o. p. f.	[illegible]	[illegible]
Chinese Blue	20%	25
Chloroform . . . lb.	50 c.	$1 00
Chocolate . . . lb.	2 c.	[illegible]
Cinchonidia	free	[illegible]
" Sulph. of	25%	40%
Cinnamon and chips unground . . . lb.	free	20 c.
" Ground	10%	[illegible]
Civet, crude	free	free
" Not crude	10%	[illegible]
Clocks and parts of	30%	35%
Cobalt	free	[illegible]
" Ore	"	free
" Oxide of	20%	20%
Cocculus Indicus	free	free
Cochineal	"	"
Cologne . . . gall.	$2 & 50%	$3 & 50%
Combs, All	[illegible]	35%
Copperas . . . lb.	$\frac{3}{10}$ c.	[illegible]
Copper, Sulphate of . . . lb.	3 c.	4 c.
" Subacetate of	free	free
Corks	25%	30%
Cosmetics	50%	50%
Cudbear	free	free
Cutch	"	"
Cuttle-Fish Bone	"	"
Cream Nuts	"	"
Cream of Tartar . . . lb.	6 c.	10 c.
Cyanite	free	free
Dandelion Root . . . lb.	2 c.	3 c.
Dextrine	1 c.	10%
Divi Divi	free	free
Dragon's Blood	"	"
Drugs, crude, n. o. p. f.	"	"
Drugs, ground	10%	"

	New Rate	Old Rate.
Emery, grains	1 c.	2 c.
Emery, Ground	1 c.	1 c.
Emery Ore . . . ton	free	$6.00
Epsom Salts	[illegible]	1 c.
Ergot	free	free
Ether, Œnanthic . . . oz.	$4 [illegible]	$4 00
Ether, Sulphuric . . . lb.	50 c.	$1 00
Extract, Annatto	free	free
Extract, Medicinal	[illegible]	40%
Fish Bladders	free	free
Fish Oils, products of American fisheries	"	"
Fish Oil, all other	[illegible]	20%
Flour, Sago	free	free
Flour, Root	"	"
Fruit Juices	[illegible]	[illegible]
Fruit Ethers . . . lb.	$[illegible]	$2 50
Fusel Oil . . . gal	[illegible]	$2 00
Gambier	free	free
Gelatin	[illegible]	25%
Gilead, Balm of	free	free
Ginger Ale, etc	[illegible]	[illegible]
Ginger Root	free	free
Ginger Root, Ground	10%	20%
Glass Bottles, if filled, in addition to duty on contents	[illegible]	[illegible]
Glass, Manuf. of	45%	40%
Glauber Salts . . . lb.	[illegible]	[illegible] c.
Glucose	[illegible]	20%
Glue, Common	20%	20%
Glue, Stock, all	free	free
Glycerin, Crude, brown or yellow, of sp. gr. of not over 1.25 at temp. of 60 Fahr., lb	2 c.	30%
Glycerin, Refined . . . lb.	5 c.	35%
Grape Sugar	[illegible]	20%
Gum Amber	free	free
" Aloes	"	"
" Arabic	"	"
" Asafœtida	"	20%
" Benzoin	"	free
" Chicle	"	"
" Gamboge	"	"
" Galbanum	"	"
" Guaiac	"	"
" Mastic	"	"
" Myrrh	"	"
" Olibanum	"	"
" Sandarac	"	"
" Senegal	"	"
" Substitute . . . lb.	1 c.	10%
" Talc	free	free
" Tragacanth	"	"
" Resins, *not* edible, crude	"	"
" Resins, " " not crude	10%	20%
" British . . . lb.	1 c.	20%
Gypsum, ground and calcined	20%	[illegible]
Hair pencils	[illegible]	35%
Honey . . . gal.	20 c.	20 c.
Hops . . . lb.	8 c.	5 c.
Indigo	free	free
" Artificial	"	10%

	New Rate.	Old Rate.
Indigo Carmined.	10%	20%
" Extracts of.	10%	10%
Inks of all kinds	30%	35%
Ink powders	30%	35%
Iodine, crude	free	free
Iodine, Re-sublimed. . . . lb.	40 c.	75 c.
Iodoform . . . . lb.	$2.00	15%
Iridium.	free	free
Iron, Sulphate of . . . . . lb.	$\frac{3}{10}$ c.	½ c.
Ipecac	free	free
Isinglass	25%	"
Jalap.	"	"
Juice, Lemon or Lime	"	10%
Kelp	"	free
Kieserite	free	20%
Lactarin	"	"
Laudanum	25%	40%
Lead, Acetate of, Brown . lb.	4 c.	5 c.
" " White . lb.	6 c.	10 c.
" Nitrate of. . . . . . lb.	3 c.	3 c.
Leeches.	free	free
Lemon Juice	"	10%
Licorice Juice . . . . . . lb.	3 c.	5 c.
" Paste or Rolls . . lb.	7½ c.	10 c.
" Root, unground. . .	free	free
" Root, ground. . . .	10%	"
Lime, Borate of. . . . . . lb.	3 c.	"
" Citrate of.	free	"
" Chloride of.	"	"
" Juice of	"	. 10%
" Sulphate of	"	20%
" Citrate of	"	free
" Borate of . . . . . . lb.	3 c.	"
Litharge . . . . lb.	3 c.	3 c.
Litmus, all	free	free
Mace. . . . . lb.	"	25 c.
Madder, Extract of	"	free
" Ground or prepared.	"	"
" Indian, and Extracts of	"	"
" Indian, gr. or prepared.	"	"
Magnesia, Calcined. . . . lb.	10 c.	12 c.
" Carbonate . . . lb.	5 c.	6 c.
Manna	free	free
Meat, Extracts of	20%	20%
Medicinal barks, flowers, leaves, plants, roots and seeds, in a crude state . .	free	free
Medicinal barks, flowers, leaves, plants, roots and seeds, *not* crude.	10%	free
Medicinal preparations . . .	25%	40%
Milk, sugar of	free	free
Mineral Waters	"	"
" " Artificial. . .	3 %	25%
Morphia . . . . oz.	$1 00	$1 00
Morphia, All Salts of . . . oz.	$1.00	$1.00
Mineral Wax	free	20%
Mosses, med. and *not* edible, crude.	"	free
Mosses, med. and *not* edible, *not* crude	10%	20%

	New Rate.	Old Rate.
Moss, Iceland.	free	free
Muriate of Potash.	"	"
" Cinchona	25%	40%
" Strontium	25%	20%
Musk, crude, in natural pod .	free	free
" not crude.	10%	20%
Mustard, ground, in bottles or otherwise. . . . . . . lb.	10 c.	14 c.
Mustard in bulk.	10 c.	10 c.
Myrobolan, CRUDE	free	free
" not crude	10%	"
Nitrates, all, for medicinal purposes	25%	40%
Nitrates, Nitre Cake, crude or refined.	20%	free
Nutgalls, Crude.	free	"
" Not crude	10%	"
Nutmegs . . . . lb.	free	20 c.
Nuts, Cocoa	"	free
" Brazil and Cream . . .	"	"
Nux Vomica	"	"
Oatmeal . . . . lb.	½ c	½ c.
Oils, Essential, n. o. p. f. . .	25%	50%
Oil, Almonds	free	free
" Amber, crude and rectifi'd	"	"
" Ambergris	"	"
" Anise, or Aniseed. . . .	"	"
" Aniline, crude	"	"
" Anthos.	"	"
" Aspic, or Spike Lavender	"	"
" Bene, or Sesame	"	"
" Bergamot	"	"
" Cajaput	"	"
" Cassia	"	"
" Cedrat	"	"
" Chamomile.	"	"
" Cinnamon	"	"
" Citronella, or Lemon Grass	"	"
" Civet	"	"
" Cocoa-Nut	"	"
" Cotton-Seed . . . . gal.	25 c.	30 c.
" Croton . . . . lb.	50 c.	$1 00
" Dead, or Coal Tar . . lb.	20%	20%
" Fennel	free	free
" Flax, or Linseed . . gal.	25 c.	30 c.
" Fruit . . . . lb.	$2 50	$2 50
" Fusel . . . . gal.	10%	$2 00
" Hempseed . . . . . . gal.	10 c.	23 c.
" Jasmine	free	free
" Juniper	"	"
" Lavender	"	"
" Lemon Grass or Citronella	"	"
" Lemons . . . . lb.	"	50 c.
" Limes	"	50%
" Mace	"	free
" Neroli	"	50%
" Olive . . . . gal.	25%	25 c.
" " Salad . . . . . gal.	25%	$1 00
" Orange Flower	free	50%
" Orange . . . . lb.	"	50 c.
" Bay Leaves, Essence, or Bay Rum Essence, or Oil . . . . lb.	$2 50	$8 00

	New Rate.	Old Rate.
Oil, or Essence of Rum . . oz.	50 c.	50 c.
" Origanum, Red or White.	free	free
" Palm	"	"
" Poppy	"	"
" Rape Seed . . . . . gal	10 c.	23 c.
" Rosemary, or Anthos . .	free	free
" Rose	"	"
" Sesame, or Bene	"	"
" Spermaceti, Whale, and other fish oils of Am. fisheries	"	"
" Thyme, red or white . .	"	"
" Valerian	"	"
Oil Seeds, Hemp, Rape, and others of like character, *not* including Lin or Flax Seed . . . . lb.	¼ c	½ c
Olive Oil . . . . gal.	25 c.	25 c.
" " Salad	[illegible]	$1 00
Opium, Aqueous Extract of, for med. uses, and Tincture of, as Laudanum and all other liquid preparations	40%	40%
Opium, Crude, 9% of Morphia . . . . lb	$1 00	$1 00
Opium, prepared for smoking, and all preparations of n. o. p. f., not entitled to drawback, and cannot be removed from warehouse without payment of duties . . . . lb.	$10 00	$6 00
Orange Peel, not prepared . .	free	free
Ottar of Roses	"	"
Paper Boxes	35%	35%
Paraffin . . . . lb	free	10 c.
Patent, or proprietary medicines, cosmetics, pills, powders, and all toilet preparations	50%	50%
Pearl Barley . . . . lb.	½ c.	20%
Pencils, Hair	30%	35%
Pepper, unground, of all kinds . . . . . lb.	free	5 c.
" Ground . . . . . lb.	10%	10 c.
Perfumery, Alcoholic . . gal.	$2 & 50%	$3 & 50%
Phosphorus . . . . lb.	10 c.	20%
Pimento, unground . . . . . lb.	free	5 c.
" Ground . . . . . lb.	10%	10 c.
Pitch, Burgundy	free	free
Plumbago	"	"
Porcelain Ware	55%	40%
" In any way decorated.	60%	50%
Potash, Bichromate of . . lb.	3 c.	3c
" Caustic	20%	40%
" Chlorate of . . . . lb.	3 c.	3 c.
" Chromate of	3 c.	3 c.
" Crude Carbonate . .	20%	20%
" Hydriodate	50 c.	75 c.
" Iodate	50 c.	75 c.
" Iodide	50 c.	75 c.

	New Rate.	Old Rate.
Potash, Muriate of	free	free
" Nitrate of Crude . lb.	1 c.	1 c.
" Nitrate of, Refined lb	1½ c	2 c.
" Red Prussiate . . lb.	10 c.	10 c.
" Yellow Prussiate lb.	5 c.	5 c.
Pumice and Pumice Stone. .	free	free
Putty . . . . lb	1 c.	1½ c.
Quicksilver	10%	free
Quills, prepared or NOT . . .	free	"
" Toothpicks	20%	20%
Quinia, Barks used in the manufacture of	free	free
Quinia, Salts of	"	"
" Sulphate of	"	"
Rape Seed . . . . lb	¼ c	½ c.
Rochelle Salts, or Tartrate of Soda and Potash. . . . lb.	3 c	5 c.
Roots, *not* med. and n. o. p. f.	20%	20%
" Med. and not edible, crude	free	free
" Med. and not edible, not crude.	10%	20%
Rotten Stone	free	free
Rum, Essence of . . . . . oz	50 c.	50 c.
Saffron, Safflower, and Extracts of.	free	free
Saffron Cake	"	"
Sago, Sago cr. and Sago Flour	"	"
Salep, or Saloup	"	"
Saleratus . . . . lb.	1½ c	1½ c.
Sal Soda . . . . lb.	¼ c.	¼ c
Salts, Chemical	25%	20%
" Aniline and black. . .	free	free
" Quinia	"	"
Santonine . . . . lb.	$3.00	$3.00
Sealing Wax	20%	35%
Seeds, med., crude	free	free
" " *not* crude . . .	10%	20%
Senna	free	free
Skins, Chamois	20%	20%
Smokers' Articles	70%	75%
Soap, Castile . . . . lb.	20%	1 c. & 30%
" All Toilet . . . . . lb.	15 c	20% & 10 c.
" All other. . . . . . lb.	20%	30% & 1 c.
" Stock.	free	free
Soda Ash. . . . . lb.	¼ c	¼ c.
Soda, Bicarb . . . . lb.	1½ c.	1½ c.
" Caustic. . . . . lb.	1½ c.	1½ c.
" Nitrate	free	free
" Sal, or Crystals. . . lb.	¼ c.	¼ c.
" Silicate of . . . . . . lb.	½ c.	½ c
" Salts, if medicinal. . .	25%	40%
" Nitrate of.	free	free
Sodium	"	20%
Sounds, Fish	"	free
Spices, ground or powdered. lb.	5 c	30 c.
Sponges	20%	20%
Spunk	free	free
Starch, Corn . . . . lb.	2 c	1 c. & 20%
" Potato . . . . lb.	2 c.	1 c. & 20%
" Rice . . . . lb.	2½ c	3 c. & 20%
" All other . . . . . . lb.	2½ c.	3 c. & 20%
Storax	free	free

	New Rate	Old Rate.
Strontia, Proto-Oxide of. . .	free	free
Strychnine . . . . oz.	50 c.	$1.00
" All Salts of. . . oz.	50 c.	$1.50
Sulphur lac	free	free
" Refined, in Rolls.ton.	$10.00	$10.00
" Sublimed, or Flour. "	$20.00	$10.00
Sumac, Extract of.	20%	20%
" Crude.	free	10%
" Ground . . . . . lb.	$\frac{3}{10}$ c.	free
Tamarinds	free	"
" Preserved . . .	35%	35%
Tannic Acid . . . . lb.	$1.00	$1.00
Tannin. . . . . lb.	$1.00	$2.00
Tapioca	free	free
Tar, crude	10%	20%
Tartar, crude	free	free
" Partially refined, containing lees crystals, lb.	4 c.	6 c.
Toilet preparations, all, used as applications to the hair, teeth or mouth	50%	50%

	New Rate.	Old Rate.
Turpentine, Spirits . . . gal.	20 c.	30 c.
" Venice . . .	free	free
" Chian	free	free
" Chian, refined. .	25%	40%
Turmeric	free	free
Vaccine Virus	"	"
Valonia	"	"
Verdigris	"	"
Vitriol, blue or sulph. of copper. . . . . lb.	3 c.	4 c.
Wafers, unmedicated	free	free
" Medicated	25%	40%
" Paper	20%	20%
Wash Blue	20%	20%
Wax, Vegetable	free	free
" Mineral	free	20%
Zaffer	"	free
Zinc, Oxide of, dry . . . . . lb.	1¼ c.	1¾ c.
" In oil . . . . lb.	1¾ c.	1¾ c.
" Valerianate of	25%	40%

NOTE.—The letters n. o. p. f. signify *not otherwise provided for.*

REPORT OF THE COMMITTEE ON LEGISLATION.

THE past year has not added very materially to the legal regulation of the practice of pharmacy in the United States. It is, however, interesting from the repeal of two laws affecting pharmacy. One of these laws had been on the statute book of Pennsylvania since April 10, 1849, and imposed a special annual tax for the privilege of selling and manufacturing patent medicines, which tax was in addition to the mercantile tax levied upon every vender of drugs and medicines under a general law passed April 7, 1830. This special patent medicine tax had never been uniformly collected throughout the State, and in 1878 and 1879 judgments were given in several of the lower courts declaring the law to be inoperative for various reasons, while other courts declared the law to be in force, and this view was sustained by the highest tribunal. The Pennsylvania Pharmaceutical Association through a committee appointed for the purpose, has now succeeded to convince the Legislature of the injustice of the measure, and the obnoxious law has been repealed. This now defunct law was referred to in a previous report made by the Committee on Legislation in 1868 (see Proceedings 1868, p. 349), but was not printed with the report.

The repeal of the other law referred to was a surprise, and is worthy of special record, because it is the first instance in the United States, and probably in all civilized countries, that a law regulating the practice of pharmacy has been unconditionally repealed, without being replaced by another pharmacy law. The law now repealed was passed by the Legislature of California in 1876, and applied only to the city and county of San Francisco. From the information received it appears that the chief objection to the law on the part of some of the San Francisco druggists and apothecaries was the annual renewal of registration for which a fee of $1 had to be paid. Since the passage of the pharmacy act a new Constitution has been adopted for the State of California, by which the enactment of *local* laws by the Legislature is prohibited, and this provision furnished the pretext for quietly introducing a bill of repeal. Ostensibly the same reason was given in Pennsylvania in 1878 for the attempt to repeal the Philadelphia pharmacy act, which, however, was defeated. When it became known in San Francisco that the Legislature had repealed the pharmacy law, proper representations were made to the Senate, explaining its objects, and a motion to reconsider the vote came very near being successful, lacking only one or two votes to secure the constitutional majority of two-thirds. The governor finally signed the act, stating that such a beneficial law should apply to the whole State.

As in previous years, the last legislative period has witnessed in several of the larger States unsuccessful struggles for the enactment of State pharmacy laws, and notably may be mentioned in this connection the States of Massachusetts, New York and Pennsylvania, in each of which the measure has failed twice. The committee has to report two pharmacy laws, one for the state of Delaware being new, the other for West Virginia being an older law amended.

Delaware.—The act, a copy of which is appended to this report, applies to all towns of 500 inhabitants or over. Pharmacists actually in business at the passage of the act, and having had a practical experience of three years continually are registered without examination. No examination is required of graduates in Pharmacy or in Medicine, or of those who have a qualified chief clerk, partner or assistant. There being no pharmaceutical organization in Delaware, the State Medical Association is entrusted with the nomination of five suitable persons, of whom three are appointed by the governor for three years. The fee for registration is $1—and for examination $5; the members of the board receive no compensation; but their necessary expenses are paid from the fees, any excess going to the Public School fund. A curious feature of this law is (Sect. 5) that clerks having had one year's practical experience are considered legally competent to dispense prescriptions, without supervision or without having been examined. The sale of commercial drugs in general stores is specially permitted, and general dealers are not required to keep a record of the sales of the preparations of opium. The members of the first board appointed under this act are, John B. Price, president; James H. Morgan, secretary; and Thos. C. Roe, treasurer.

West Virginia.—The pharmacy act for this State was passed February 21, 1881, and amended and reënacted March 25, 1882, as previously reported. During the past session the legislature amended sections 9 and 11. The former now requires the sale of liquors by druggists and registered pharmacists to be made solely upon the written prescription of a practicing physician, and seems to make the pharmacist the judge as to whether the physician is in good standing in his profession, and is not of intemperate habits. The amendment furthermore prevents such a prescription to be dispensed in the store of the prescriber in case he be a druggist or registered pharmacist; but since according to Section 11 the act does not apply to physicians putting up their own prescriptions, it is to be presumed that a physician who is not a registered pharmacist, may put up for his patients also his own prescriptions for liquors.

Formerly Section 11 permitted the sale of ordinary drugs, poisons excepted, by any one "not doing business in an incorporated city or town," "or in which there is no registered pharmacist." The amended section does away with these restrictions, and permits also the unrestricted sale of patent medicines and of dye-stuffs.

The additions made to the two sections are indicated by italics in the appended copy of the law.

At the last annual meeting this Committee was instructed to forward copies of resolutions to the Hon. Secretaries of the Army and Navy, to the Surgeons-General of the Army and Navy, and to the chairman of the Army and Navy Committees of the United States Senate and House of Representatives, said resolutions favoring the conferring of the rank as commissioned officers upon the hospital stewards or apothecaries in the public service. This duty has been performed. The Committee has subsequently received a copy of the draft of a law, covering this subject, and according to which apothecaries of the Army and Navy are to pass an examination before a Medical Board in elementary chemistry, materia medica, and pharmacy, and to obtain the rank and pay—without promotion—of respectively a second lieutenant of infantry or of an ensign. A copy of this bill is attached to this report. It will come up for consideration by the next Congress, and it is to be hoped will be passed and approved. Since the resolutions of this Association above referred to were sent to the Army and Navy Committees of the last Congress, it may perhaps not be out of place to again send copies to the same Committees of the next Congress. Respectfully submitted,

JOHN M. MAISCH,
Chairman of Committee on Legislation.

I. PHARMACY ACT OF DELAWARE.

AN ACT *to regulate the practice of pharmacy in the State of Delaware.*

Senate, March 2, 1883—Introduced and read. March 6—Read second time and referred to Committee on Revised Statutes. March 15—Read third time by paragraphs as amended, and passed the Senate. Ordered to the House.

House, March 19—Read. March 20—Read second time by title, and referred to Committee on Revised Statutes. Passed House, April 16th, 1883.

WHEREAS, The skill of the physician to overcome disease depends largely upon obtaining reliable medicines skillfully and intelligently prepared; and

WHEREAS, Many unskilled and unqualified persons are engaged in the sale and compounding of drugs, medicines and chemicals, endangering thereby the health and lives of the public; therefore

Be it enacted by the Senate and House of Representatives of the State of Delaware, in General Assembly met:

SECTION 1. On and after the first day of August A. D. eighteen hundred and eighty three, it shall be unlawful for any person or persons, unless a registered pharmacist within the meaning of this act, to open or thereafter conduct any pharmacy or store, vending at retail, dispensing or compounding medicine or poisons within the corporate limits of any town of five hundred inhabitants or over, except as hereinafter provided.

SEC. 2. Any person in order to be registered must be either a graduate of some reputable College of Pharmacy or Medicine, or have had a practical experience of three years continuously, or pass an examination before the State Board of Pharmacy, or who shall constantly have in his employ or service a chief clerk, partner, or assistant, with like qualifications. That the provisions of this section shall apply to those already conducting the business, while those desiring hereafter to establish themselves in the business of vending and compounding medicines as a pharmacist must pass an examination before the State Board of Pharmacy, unless they are graduates of some recognized College of Pharmacy or Medicine, or have a chief clerk, partner, or assistant, qualified as aforesaid.

SEC. 3. That at the annual meeting of the State Medical Association in June next, ensuing, said association shall recommend from among the most skilled and intelligent pharmacists in this State, five persons (graduates in pharmacy), from whom the Governor shall appoint before the first day of July next, three men who shall constitute the State Board of Pharmacy; they shall hold their offices for three years or until their successors are duly appointed; that each member within five days after being notified of his appointment take an oath for the impartial and faithful performance of his duties.

SEC. 4. The members of said Board shall receive no compensation, but shall be entitled to pay necessary expenses incurred out of any funds coming to their hands, a detailed account of which shall be carefully kept. There shall be collected by said Board from each person entitled to be registered without examination, the sum of one dollar, and from each person undergoing an examination, as provided in Section second, five dollars. All moneys remaining in the hands of said Board, after paying necessary expenses, shall be paid to the Public School Fund of the State.

SEC. 5. That no proprietor or manager of a store shall permit any clerk who has had less than one year's practical experience to compound or dispense any physician's prescriptions, unless under the immediate eye of the proprietor or a qualified assistant.

SEC. 6. Any person or persons found vending, dispensing or compounding medicine in violation of this act, after the time specified in Section first, shall be deemed guilty of a misdemeanor, and be liable to indictment with fine and costs, not less than fifty dollars nor more than one hundred dollars for each week they conduct their business in violation of this act.

SEC. 7. Every dispenser of drugs shall keep a record of all sales of strychnine, arsenic, opium, or its preparations, unless prescribed by a physician, and the said record shall be open to inspection by proper legal authority; provided that nothing in this act shall prohibit the sale of commercial drugs in general stores, and this section shall not be deemed to require the keeping of a record in such stores of sales of the preparations of opium.

II. AMENDED PHARMACY ACT OF WEST VIRGINIA.

[See Proceedings 1882, p. 495.]

CHAPTER LXXXII.

AN ACT *to amend and re-enact sections nine and eleven of chapter fifty-two of the acts of one thousand eight hundred and eighty-one, as amended and re-enacted by chapter one hundred and twelve of the acts of one thousand eight hundred and eighty-two.*

[Passed February 22, 1883.]

Be it enacted by the Legislature of West Virginia:

1. That sections nine and eleven of chapter fifty-two of the acts of one thousand eight hundred and eighty-one, as amended and re-enacted by chapter one hundred and twelve of the acts of one thousand eight hundred and eighty-two, be, and the same are hereby, amended and re-enacted so as to read as follows:

9. No druggist or registered pharmacist shall retail any of the poisons enumerated in the following schedule, except as hereinafter provided.

Schedule A.

Arsenic and its preparations, corrosive sublimate, white precipitate, red precipitate, biniodide of mercury, cyanide of potassium, hydrocyanic acid, strychnia, and all other poisonous vegetable alkaloids and their salts, essential oil of bitter almonds, opium and its preparations, except paregoric and other preparations of opium containing less than two grains to the ounce.

Schedule B.

Aconite, belladonna, colchicum, conium, nux vomica, henbane, savin, ergot, cotton root, cantharides, creosote, digitalis, and their pharmaceutical preparations; croton oil, chloroform, chloral hydrate, sulphate of zinc, sulphate of copper, acetate of lead, mineral acids, carbolic acid and oxalic acid. Whenever any of the said poisons are sold, the box, vessel or paper in which the same is put up shall be distinctly labeled with a device bearing the death's head and cross-bones, and also the name of the article, the word poison, and the name and place of business of the seller. The seller shall also ascertain upon due inquiry that the purchaser is aware of the poisonous character of the drug, and that it is to be used for legitimate and lawful purposes. He shall, also, before delivering any of the poisons named in *Schedule A* to the purchaser, cause an entry to be made in a book kept for the purpose, which entry shall show the date of the sale, the name and residence of the purchaser, the name and quantity of the poison sold, the purpose for which it is to be used as represented by the purchaser, and the name of the dispenser; such book to be always subject to the inspection of the proper authorities, and to be preserved for at least five years from the date of the last entry. The provisions of this section shall not apply to the dispensing of drugs in not unusual quantities on the prescriptions of physicians. Nothing in this act contained shall be construed so as to protect any druggist or registered pharmacist from any penalty or forfeiture prescribed in any other law regulating the sale of alcoholic or other intoxicating liquors; and the name of any registered pharmacist who shall be convicted twice of the violation of such law shall be stricken from the register, and he shall no longer be a registered pharmacist. Nor shall this act be construed to authorize any person to carry on the business of a druggist without first having obtained a license therefor, if such license be required by any other law, or to sell, offer or expose for sale, any of the liquors, drinks, mixtures or preparations mentioned in section one of chapter thirty-two of the code of West Virginia, as amended and re-enacted by chapter one hundred and seven of the acts of one thousand eight hundred and seventy-seven, except for medicinal, mechanical or scientific purposes. *And no sale of any such liquors, drinks, mixtures or preparations shall be made by any druggist or registered pharmacist, except upon the written prescription of a* *practicing physician in good standing in his profession, and not of intemperate habits, specifying the name of the person and the quantity of such liquors to be furnished him; but no druggist or registered pharmacist, who is a practicing physician, shall himself, or by his agent or clerk, sell any such liquors, drinks, mixtures or preparations upon his own prescription.* And if any person carrying on or interested in the business of a druggist shall, in violation of this section, sell any such liquors, drinks, mixtures or preparations, he shall be guilty of a misdemeanor, and for such offense be fined not less than twenty-five nor more than one hundred dollars; and it shall be the special duty of the judge of every circuit court to give this provision in charge to the grand juries of their respective courts. In any prosecution against a person carrying on or interested in the business of a druggist for selling any such liquors, drinks, mixtures or preparations, contrary to law, if the sale be proved, it shall be presumed that such sale was unlawful, unless the contrary be shown.

11. This act shall not apply to physicians putting up their own prescriptions, *nor to the sale of patent proprietary medicines and* such other ordinary drugs *and dye-stuffs* as are usually sold in a country store. The term "ordinary drugs" shall not be held to include any of the poisons named in schedules "*A*" and "*B*," nor any intoxicating liquors.

J. J. WOODS,
Speaker of House of Delegates.

THOS. J. FARNSWORTH,
President of Senate.

STATE OF WEST VIRGINIA,
OFFICE OF SECRETARY OF STATE,
February 28, 1883.

I certify that the foregoing act having been presented to the Governor for his approval, and not having been returned by him to the house of the Legislature in which it originated, within the time prescribed by the Constitution of the state, has become a law without his approval.

RANDOLPH STALNAKER, JR.,
Secretary of State.

[NOTE BY THE CLERK OF THE HOUSE OF DELEGATES.]

The foregoing act takes effect at the expiration of ninety days after its passage.

III. PROPOSED LAW RELATING TO APOTHECARIES OF THE ARMY AND NAVY.

A BILL *to authorize the President of the United States of America by and with the advice and consent of the Senate to grant to the Apothecaries of both Army and Navy a Commission.*

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

1st. That the Apothecaries of both Army and Navy shall receive a Commission, those of the Army to have the relative rank of a Second Lieutenant of Infantry, those of the Navy to have the relative rank of an Ensign in the Navy.

2d. That the said Apothecaries of both Army and Navy shall not be in line of promotion.

3d. That the said Apothecaries of both Army and Navy shall receive the pay and emoluments of said grades in their respective branches of the Service.

4th. That the said Apothecaries of both Army and Navy shall not be entitled to any of the benefits that may be conferred by this bill until they shall have passed a satisfactory examination in the following branches, viz., Elementary Chemistry, Materia Medica, Pharmacy, and Botany.

5th. That the said board of examiners shall consist of three Medical Officers, to be chosen those from the Army by the Sec'y of War, and those from the Navy by the Sec'y of the Navy.

6th. That each and every Apothecary who shall be serving in such capacity at the time of the passage of this Act, shall be granted an examination, and if found proficient in the above mentioned branches shall receive a Commission in that branch of the Service to which he may be attached.

7th. Resolved that this Act shall take effect immediately after the passage of the same, or so soon thereafter as the requirements above mentioned in regard to the appointing of the said board of examination can be convened.

REPORT OF COMMITTEE ON EXHIBITION.

To the President of the American Pharmaceutical Association.

Your committee appointed to examine the articles exhibited at the meeting of the Association held at the Smithsonian Institution, in the U. S. National Museum, Washington, D. C., September 11, 12, 13 and 14, 1883, have made as full an examination as the limited time would admit of with the large amount of goods displayed, and beg leave to submit the following report:

The Materia Medica Collection of the U. S. Nat. Museum, which was found very interesting, contains a great variety of rare and curious specimens, and is intended to include any and all drugs of present or former use among civilized or savage nations, with their alkaloids and most prominent preparations, also pharmaceutical apparatus and surgical instruments and appliances. These are to be presented in every way that can add to their instructiveness; by the specimens themselves, by photographs or colored plates, by sections, and magnified representations of the same.

The collection now consists of about 3,000 specimens, comprising the principal drugs of the ordinary market, many rare drugs from various sources, all the varieties of cultivated cinchona barks from India, Ceylon and Jamaica, with accompanying herbarium specimens, remains of the drug exhibits from several countries at the Centennial Exhibition in 1876, and individual contributions and exchanges. An index to the collection is in press, and will be furnished *gratis* on application.

The collection is classified according to natural sources, into: 1. Animal Products. 2. Vegetable Products. 3. Products of Fermentation and Distillation. 4. Inorganic Products. Each specimen is being furnished with a descriptive label, giving name, source, habitat and general properties and uses.

Colored plates of medicinal plants to the number of 900 are at hand for illustration of vegetable products.

The aim and object of the collection is to present to the eye, as completely as possible, the materials and methods used by mankind in the treatment of disease and injury—and contributions are solicited of drugs, instruments or appliances, which should in all cases be accompanied with the name, scientific and vernacular, sources, localities in which found and used, properties so far as known, and any other available information.

Thomson & Muth, Baltimore, made a very large and magnificent exhibit of foreign and indigenous crude drugs, in original packages, the indigenous articles as put up for export, also general drugs in great variety. The display was tastefully arranged, and the largest and most interesting of any made. The articles were elegant in quality, comprising the following:

Roots.—Senega, pink, small and large fibre; serpentaria, golden seal, mandrake, wild ginger, American hellebore, American sarsaparilla, sassafras, American angelica and lady slipper.

Barks.—Wild cherry, sassafras, fringe tree, witch hazel, dogwood, black haw, blackberry root, prickly ash, tag alder and Wahoo.

Herbs.—Hoarhound, wild carrot, broom, sweet fern, chestnut, golden rod, clover blossom, maiden hair, stramonium, liverwort, boneset and hair cap moss.

Flowers.—Elder.

Imported goods in original packages as follows:

Roots.—Rhubarb, ipecac, jalap, Honduras and Mexican sarsaparilla, colchicum, valerian, Dutch and German vetivert, Florentine and Verona orris, and galangal.

Barks.—Buckthorn, angostura, cinchona, calisaya, succirubra, and soap.

Herbs.—Cannabis indica and chirata.

Leaves.—Matico.

Seed.—Colchicum.

Peel.—Orange curacoa, orange discs.

Gums.—Turkey, Arabic 1st, 2d and 3d, picked opium, Aleppo tragacanth, Barbadoes aloes in gourds and mass, Curacoa aloes dark and liver color, Socotrine aloes in tin and in skins.

Oils.—Virgin olive in jar and bottles; lemon, Sandersons and Pasquali; orange, Wolfe, Raabe and Co's; bergamot, Sandersons and Pasquali; citronelle, cassia and aniseed.

Colocynth apples, Trieste and Spanish cassia buds.

Ignatia bean, nux vomica, areca nuts, calabar bean, cocculus indicus, lupulin, kamala, Russian cantharides, gum myrrh select and commercial; guaiac in tears, kino and mastic, buckthorn berries, guarana, kousso, cassia fistula, Russian isinglass, Trieste and East India cuttle fish, Japan wax, civet, agaric, flores pyrethrum roseum and flores crysanthemi, calamus bleached, conium seed, muskroot, mezereon bark, orris root finger angelica root foreign, male fern root in teeth, pomegranate bark and rind, and Ceylon cinnamon.

Cardamom seeds, bleached Mangalore, Malabar, Aleppee, Ceylon, Tillecherry, Calicut and long Ceylon; samples of scammony, Aleppo, Skilip and Cangory, resin scammony made from the root; kola nuts, whole split.

Concentrated extracts made from imported oils from different sources.

W. H. Schieffelin & Co., New York, made a large and instructive display of crude drugs in original packages, also various articles of their own manufacture, with a variety of rare and curious substances; the following is a partial list as exhibited by them: 1 cabinet case containing a large number of samples of soluble coated pills and granules; 11 cases of fine sponges; insect powder, and a sample of the whole Dalmatian flowers; 1 basket Para anatto; 1 cask new season German chamomile flowers; 5 grades gum Arabic, in original cases; gum Arabic, Turkish grain; gum benzoin, Sumatra; gum gamboge; gum guaiac; gum kino; gum olibanum, tears; Turkish and Aleppo tragacanth; oil bergamot; oil orange; oil lemon; "sublime" olive oil; "Lucca" olive oil; ipecac root; Honduras sarsaparilla; Mexican sarsaparilla; star anise seed; colored Castile soap, of the best brands; Japan wax; mineral wax ("ceresin" from European ozokerite); bayberry wax; triple rose water; orange-flower water; a full line of R. W. Gardner's preparations, including syrups of the hypophosphites, syrup of hydriodic acid, elixirs, etc.; Japanese nutgalls, new to this market; 5 curious specimens of sponges; 1 empty package oil of cajuput, very odd, and seldom seen; 5 boxes finest cup sponges; Moller's cod-liver oil; 13 typical specimens Turkish gum opium, with assay, representing all the grades now obtainable in the Smyrna market; 1 sample concentrated nitrous ether, introduced by this house, and now very largely used for extemporaneous preparation of the pharmacopœial spirit nitrous ether; oil sweet almonds; oil cassia, Chinese; imported bay rum; cut rhubarb, round, trimmed, cubes and fingers; oil of anise; 1 horn filled with civet; 1 sample jequirity seed (Abrus precatorius, or liquorice seed); 10 samples fine chemicals; bisulphate of quinine, fine white crystals, quickly soluble in 10 parts cold water; oleates of lead, copper, mercury 10 % and 20 %, bismuth, quinine; 10 samples pharmacopœial triturations; 1 sample saccharated pepsin, U. S. P.; 10 samples standard fluid extracts, by repercolation; powdered extracts; abstracts (U. S. P., 1880); syrups, including syrup iodide of iron, of pharmacopœial strength, not affected by prolonged exposure to the air; extracts lemon and vanilla; quinine sulphate, W. H. S. & Co. brand; samples cinchona barks, showing all the principal commercial varieties, and named by the celebrated English quinologist, John Howard; scaled salts of iron: those containing quinine or strychnine, with a definite statement on the label showing the actual amount of alkaloid present; resin podophyllum. All crude drugs and manufactured products were shown in large amounts and attractively displayed.

McKesson & Robbins, New York, made a very large exhibit of Pharmaceutical preparations, chemicals, gelatin-coated pills, oleates, fluid and solid extracts, medicated waters, large specimens of the alkaloids of cinchona and opium, very handsome and of fine quality, one hundred and twelve specimens of cinchona barks in bales and boxes, with the yields of alkaloids named with each package, also two living specimens of the cinchona tree, and a great variety of crude drugs, in original packages.

Peek & Velsor, New York, displayed their regular line of roots, herbs, barks, seeds, etc. Select powders P. and V. brand from selected crude material, select pressed herbs in ounce packages free from stems, and ground goods for percolation.

B. O. & G. C. Wilson, Boston, exhibited a large collection of select crude drugs, select pressed herbs of very fine quality, powdered drugs, fluid extracts, etc.

Wm. R. Warner & Co., Philadelphia, displayed a great variety of Pharmaceutical preparations, prominent amongst which are their sugar-coated pills, granules, silvered cachous, and effervescing salts, also their newly designed shop bottle, a case containing medals from 8 world's fairs of gold, silver and bronze. A novel and noteworthy feature of this display is a new class of preparations denominated dosemetric granules, consisting of carefully subdivided doses of active and proximate principles, such as scillitin, hyoscyamin, koussin, cicutin, pilocarpin, colchicin, daturin, etc. They also exhibited a case containing 55 rare alkaloids.

Sharp & Dohme, Baltimore, exhibited a full line of sugar-coated and gelatin coated pills, fluid extracts, elixirs, a large assortment of pharmaceutical preparations, scaled iron and salts, etc.

John F. Hancock, Baltimore, showed a full assortment of his medicated lozenges of all kinds, flavors, colors and sizes, making a very handsome and interesting display.

John Wyeth & Bro., Philadelphia, made a fine display of fluid extracts, elixirs, syrups, wines pepsin, Marvin's cod-liver oil, and a full list of Bishop's granular effervescing salts, compressed pills, hypodermic tablets; Lawton's absorbent cotton, long fiber, and very white, arranged on black walnut pyramids, making a very handsome display.

Trommer's Extract of Malt Co., Tremont, Ohio, displayed a complete line of their malt combinations, including their new infant's malt for mixing with wheat flour to make infant's food.

Geo. I. McKelway, Philadelphia, presented his pharmaceutical specialties, consisting of bitter wine of iron; ferrated elixir calisaya; elixir yellow Peruvian bark; elixir valerinate of ammonia and apiol of his own make; also, Hubbell's prepared wheat for infants and invalids.

Burroughs Bros. Manufacturing Co., Baltimore, exhibited one hundred and thirty-eight kinds of fluid extracts, made by their circulating hot-water process, at a temperature of 112° to 160°, presenting a handsome appearance, and fine representatives of the substances from which they were made.

Wm. H. Brown & Bro., Baltimore, made an elegant display of toilet and holiday boxes and cases, handkerchief extracts, put up in cut and etched bottles, plush and satin odor cases, whisk-holders, pin-cushion sets, covered bottles, sachet bags, etc., all of their own manufacture.

Eastman & Bros., Philadelphia, exhibited a fine assortment, and of superior quality, of their perfume extracts, colognes, toilet soaps, and fancy odor and toilet cases. Their perfume extracts, in bulk, are in pint bottles, with a one ounce graduated measure attached to each stopper for convenience in measuring.

Chesebrough Manufacturing Co., New York, displayed a great variety of vaseline toilet preparation, also ointments with vaseline as a base, and vaseline shoe-blacking.

Binghampton Oil Refining Co. exhibited petrolina and petrolatum of the U. S. P., petrolina oil, cold cream, camphor ice, etc., prepared with this article in neat packages, and of fine quality.

Bullock & Crenshaw, Philadelphia, made a large display of sugar-coated pills, granules, fluid extracts, elixirs, etc. Among their specialties were aromatic elixir glycyrrhiza used as a disguise for quinine, cathartic elixir and aromatic elixir of nut-gall. These preparations all presented a handsome appearance.

Seabury & Johnson, New York, exhibited a complete assortment of their medicinal plasters, in rubber combination and plain, courtplasters in fancy and ornamental packages, corn and bunion plasters, carbolated antiseptic gauze, in large sheets and bandages, absorbent, salicylated, carbolated and borated cotton, flax and absorbent lint, oil silk, oil muslin, gutta-percha tissue, etc. The elegant manner in which their articles are gotten up deserves special mention.

Tarrant & Bro., New York, made a very handsome display consisting of rare and expensive essential oils in great variety, oil patchouly in crystals, specimens of cultivated and wild vanilla, original packages of musk, Hoff's malt extract, fluid extracts, elixirs, and pharmaceutical preparations.

Eisner & Mendelson, Philadelphia, exhibited a large assortment of rare and new German chemicals, amongst which were cotoin, eserine, pilocarpine, apiol, osmic acid, menthol, thymol, chinoline, diastase, resorcin, hyoscyamine, picrotoxin, etc.; also a large specimen of Russia castor.

W. G. Ducket, Washington, D. C., exhibited strawberry, raspberry, blackberry and pine-apple fruit juices made from fresh fruits, which he claims are entirely protected from fermentation. They are elegant representatives of the substances from which they are made. He also showed specimens of syrups made from them.

C. Am Ende, Hoboken, N. J., exhibited absorbent and medicated cottons, antiseptic gauze, borated absorbent gauze, antiseptic gauze with iodoform, bone drainage tubes, and catgut ligatures.

John Berry, Biddeford, Maine, exhibited the Berry pressure percolator, of several sizes, which attracted considerable attention, and seemed to meet with general approval.

J. J. Georgus, Washington, D. C., exhibited his corn and bunion shields. The design is better than the plasters usually sold for the purpose.

Bahmann & Hoehn, New York, exhibited a case of thermometers, hydrometers, and a variety of barometers; also their patent fever thermometer, new style graduated measures, chemical glassware, artificial eyes, etc.

Wm. B. Burk & Co., Philadelphia, exhibited elegant specimens of Turkish sponges, hand-made prescription corks of very fine quality, French and English chamois skins, etc.

J. W. Colcord, Lynn, Mass., exhibited his patent bottle-tap in operation, made of hard metal nickel plated, with rubber bulb for forcing the air in and the liquid out—the flow is regulated by a stop-cock.

Cornell & Shelton, Birmingham, Conn., exhibited a great variety of their patent folding paper boxes; also pill, powder, and prescription boxes.

Gillam's Sons, Philadelphia, exhibited printed gummed cork tops, which are used instead of wax, embossed envelopes, etc.

H. F. Osborne, Newark, N. J., exhibited his patent meat-juice presses. They are simple in construction, and easy to work.

The Sparrow Mixer and Kneader Co., Boston, exhibited their centrifugal mixer. This is the most complete of anything of the kind we have ever seen for mixing dry powders of any kind, wet substances, and making emulsions. The work is done quickly and perfectly, without any waste of material.

R. W. Tansill & Co., Chicago, exhibited their 5-cent Tansill Punch cigar.

Henshaw & Cushing, Boston, exhibited a large variety of labeled pill and powder boxes, lithographed labels, etc.

I. Killgore, of Utica, N. Y., exhibited chlorate of potassa tablets in pound boxes.

P. J. McElroy, East Cambridge, Mass., exhibited 48 different kinds of glass syringes. These were very nicely made, and the points even and smoothly finished.

Randolph Paper Box Co., Richmond, Va., made a large and elegant display of druggists' pill, powder and prescription boxes, impervious ointment boxes, ornamental paper and plush-covered boxes, beautifully arranged.

Young, Ladd & Coffin, New York, manufacturers of Lundborg's perfumery, made a tasteful exhibit of their perfumes, arranged in a very attractive manner. The new odors edenia, Marechal Niel, rose, lily of the valley, Alpine violet, and ocean spray, they distributed in miniature samples, which were eagerly sought after. The Lavender water and Rhenish cologne were very superior. They also exhibited a large variety of elegant plush, leather and wood odor cases, wicker and fancy boxes, hand-painted Limoges jugs filled with extracts, very beautiful, and Rookwood pottery jugs filled with Rhenish cologne.

Theo. Ricksecker, New York, displayed very superior perfumes in quaint original bottles and handsome packages. Likewise his skin soap, face powder, and other specialties.

Sallade & Loveland, New York, displayed an attractive assortment of perfume extracts, fancy and toilet articles, camphor ice, and various specialties.

A. S. Schafer, Baltimore, exhibited foreign and American mineral waters.

Mellor & Rittenhouse, Philadelphia, exhibited cases of licorice of various size sticks of superior quality; licorice lozenges, powdered licorice, and ammoniacal glycyrrhizin, all of their own manufacture.

R. W. Gardner, New York, exhibited samples of his elixirs, syrup of hypophosphites, syrup of hydriodic acid, etc.

Andrew Geyer, East Cambridge, Mass., exhibited samples of his nipple shields and nipple shields for sore nipples.

James S. Kirk & Co., Chicago, exhibited their toilet and fancy soaps and perfumery. Their soaps and perfumes were of very superior qualities, and gotten up in the most attractive styles.

John M. Maris & Co., New York and Philadelphia, exhibited a line of very handsome toilet and cologne bottles, druggists' show bottles, druggists' glassware, lozenge machine, and various pharmaceutical utensils.

John Matthews, New York, exhibited very handsome soda-water draught stands, wall apparatus, counter stands, tumbler washers, a new generator with duplex gas-washer, and syphon filling machine, with other appliances, all of superior workmanship and beauty.

Oldberg-Wall Laboratory, St. Louis, exhibited a large number of fluid extracts, elixirs, and chemical and pharmacuetical preparations. Their articles were handsome in appearance and well gotten up.

Vogeler, Winkelman & Co., Baltimore, exhibited elegant cut-glassware, odor and fancy toilet cases, mirrors, ornamental stands, perfumery of very superior quality, soaps, face powders, and various toilet articles. Many of these articles were very handsome.

Henry Troemner, Philadelphia, exhibited a large variety of scales for prescription and counter use. His new solution scales, weighing as high as 20 kilos, and sensitive to a half grain, attracted much attention, and all scales of his manufacture are of superior workmanship and great accuracy.

Torsion Scale and Balance Co., Cincinnati. Their scales are on a new principle, and they claim for them great delicacy of action by the prevention of friction, using gold and silver alloy wires, which the beam is fastened to, and they twist and turn as the beam moves up or down.

Robert Shoemaker, Philadelphia, exhibited Johnson's fluid beef, which they manufacture, pure powdered drugs, cut rhubarb, pure beeswax, etc.

Lancaster County Vaccine Farm, Marietta, Pa., exhibited crusts, tablets, tubes and points. The preparation of virus is under the special care of Dr. Alexander, the proprietor, and is obtained from the best grain-fed cattle.

H. Waldstein, New York, exhibited his new style ear trumpet and accoustic cane.

Ware Manufacturing Co., Camden, N. J., exhibited their suspensory bandages of various sizes and qualities.

Whitall, Tatem & Co., Philadelphia, made a large and beautiful display of fancy and cut glass cologne bottles, druggists' glassware, chemical ware, graduated measures, syringes, etc.; also their new prescription bottles with the name of the article blown in the glass, and prescription scales.

Charles C. Wells, Saratoga, N. Y., exhibited his porcupine pill-coating machine of various sizes, a very nice arrangement, enabling the pharmacist to coat a large or small lot of pills with gelatin.

Winser, Dornutzer & Co., New York, exhibited beautiful specimens of lithographed labels, envelopes, wrappers and printing of various kinds, also their new patent-back prescription blank-book.

Cushing Process, Boston, Mass., exhibited brandy, whisky, rum and rock and rye, made by their patent process, which they claim adds greatly in ageing liquors.

Dr. Carl L. Jensen, Philadelphia, exhibited fine samples of his crystal pepsin, in ounce and pound bottles, and peptonized beef. Dr. Jensen has recently procured a patent on his scaled pepsin.

There was a general display of the pharmaceutical literature of this country made, but as we have no list, are unable to report the journals by name.

W. J. M. GORDON, *Chairman*, Cincinnati.
WM. J. JENKS, Philadelphia.
J. A. MILBURN, Washington, D. C.
NORMAN A. KUHN, Omaha, Neb.
THOS. WHITFIELD, Chicago.

SPECIAL REPORTS AND ESSAYS.

I. PHARMACY.

ON SPECIFIC VOLUMES.*

BY OSCAR OLDBERG, PHARM. D., SAINT LOUIS.

The term SPECIFIC VOLUME is proposed by the writer to express in pharmacy and other arts the relative volumes of substances, in the same sense as the term "specific gravity" designates their relative weights.

I am aware that the term "specific volume" has been applied of late years in chemical physics to express the relation of the atomic volume to the specific gravity at the ordinary boiling points; but for this purpose the terms "atomic volume," "molecular volume," and "equivalent volume" have also been used, and it is not believed that the use of the term "specific volume" in the sense proposed by the writer will in the least interfere with its limited application in chemical physics.

The term specific volume is analogous to, and the parallel of, the term specific gravity, and will be so understood by pharmacists. It is the only term the writer has been able to find which adequately and exactly expresses what is intended, and it was accordingly selected.

The specific volumes of substances are inversely as the specific gravities, and parallel with the latter. The volume of one gram of any liquid stated in cubic centimeters expresses its specific volume. Thus, as 1,000 grams of the officinal alcohol measures 1,234.5 cubic centimeters at 25° C. (77°F.), the specific volume of that liquid is 1.2345 at the temperature named.

As the specific gravity of a liquid or solid is the weight of a certain volume of that liquid or solid divided by the weight of an equal volume of water, so the specific volume of a substance is the quotient obtained by dividing the volume of a certain quantity by weight of that substance by the volume of an equal weight of water. It is, in other words, the quotient obtained by dividing unity by the specific gravity:

$$\frac{1}{\text{specific gravity}} = \text{specific volume.}$$

The product obtained by multiplying the specific gravity by the specific volume is ONE.

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* Read at the Fourth Session.

To illustrate the character and uses of specific volumes, we account for the familiar fact that a pound of alcohol measures more than a pound of water by the fact that the specific volume of alcohol is greater than the specific volume of water. The absolute weight of any given quantity of a liquid, expressed in grams, when multiplied by the specific volume, at once gives the number of cubic centimeters occupied by it.

Since the new Pharmacopœia of the United States was published, the necessity of a table of specific volumes becomes manifest. If we take any one of the pharmacopœial working formulæ for tinctures, we find that by substituting grams for "parts by weight," the final product is to be one hundred or one thousand grams; but we cannot ascertain how much that product will measure, except by a troublesome division of the number of grams by the specific gravity; whereas, if we know the specific volume, the whole problem then resolves itself into simply multiplying the specific volume by 100 or 1,000, as the case may be.

Numerous blunders are being made in attempting to translate the working formulæ of the new Pharmacopœia from parts by weight into definite quantities by weight and measure, and many of these errors arise from the necessity of comparatively difficult and tedious calculations, in the absence of a table of specific volumes.

I have prepared and now present in connection with this paper a table, showing the specific gravities and the specific volumes of the liquids of the Pharmacopœia, so far as their specific gravities are officially given. It embraces the acids, ammonia, alcohol, diluted alcohol, ether, glycerin, syrup, the solutions, many of the oils, etc.

An examination of this table will readily convince any one of the practical usefulness of specific volumes. We find in it, for instance, that the specific volume of ether is 1 1/3, that of water is 1, that of glycerin 4/5, that of benzin 1 1/2, and that of chloroform 2/3; therefore 1 1/3 pints ether, 1 pint water, 4/5 pint glycerin, 1 1/2 pints benzin, and 2/3 pint chloroform, respectively have the same weight. We also learn at once from the specific volume the number of cubic centimeters occupied by each gram of these liquids.

The pharmacist can learn by the aid of this table how large a bottle or other vessel it takes to hold a certain quantity by weight of any of these liquids, and that it takes twice as large a bottle to hold a pound of ether as to hold a pound of chloroform.

The specific volumes given are of course calculated from the official specific gravities, and to verify their correctness it is only necessary to multiply the numbers by the specific gravities, when the product must in each case be exactly ONE, or as near unity as is practicable.

I believe that a table of this kind in our Pharmacopœia would be of great practical value, as it entirely obviates some of the objections to the method of "parts by weight."

The table accompanying this paper shows the weight of 100 fluid ounces, and the volume of 100 avoirdupois ounces, of each of the liquids included in it.

TABLE OF SPECIFIC GRAVITIES AND SPECIFIC VOLUMES OF SOME LIQUIDS.

Liquids.	Weights.			Volumes.		
	Specific weight (water = 1) sp. gr.	Weight of 1000 cc. in grams	Weight of 100 U. S. fl. ozs. in av. ozs.	Specific volume (water = 1)	Volume of 1000 gm. in cc.	Volume of 100 av. ozs. in U. S. fl. ozs.
Acid. Acet. U. S	1.0480	1048.	109.1	.954	954.	91.6
Acid. Acet. Dil. U. S	1.0083	1008.3	105.0	.972	972.	95.2
Acid. Hydrobrom., 34 per cent	1.303	1303.	135.7	.767	767.	73.6
" " Dil. U. S	1.077	1077.	112.2	.928	928.	89.1
" Hydrochlor. U. S	1.160	1160.	120.8	.862	862.	82.8
" " Dil. U. S	1.049	1049.	109.3	.953	953.	91.5
" Lactic. U. S	1.212	1212.	126.2	.833	833.	80.
" Nitric. U. S	1.420	1420.	148.	.704	704.	67.6
" " Dil. U. S	1.059	1059.	110.3	.944	944.	90.6
" Oleic. U. S	0.800	800.	83.3	1.250	1250.	120.
" Phosphoric. U. S	1.347	1347.	140.3	.742	742.	71.2
" " Dil. U. S	1.057	1057.	110.1	.945	945.	90.7
" Sulphuric. U. S	1.840	1840.	191.7	.543	543.	52.2
" " Dil. U. S	1.094	1094.	114.	.914	914.	87.7
Æther. U. S	0.750	750.	78.1	1.333	1333.	128.0
" Fortior. U. S	0.725	725.	75.5	1.379	1379.	132.4
Alcohol. U. S. (at 15.6° C. = 60° F.)	0.820	820.	85.4	1.219	1219.	117.
" U. S. (at 25° C. = 77°)	0.812	812.	84.6	1.231	1231.	118.1
" Dil. U. S. (at 15.6° C. = 60° F.)	0.928	928.	96.7	1.077	1077.	103.4
" Dil. U. S. (at 25° C. = 77° F.)	0.920	920.	95.8	1.087	1087.	104.4
Aqua Destillata	1.000	1000.	104.17	1.000	1000.	96.0
" Ammoniæ. U. S	0.959	959.	99.9	1.043	1043.	100.1
" " Fortior. U. S	0.900	900.	93.75	1.111	1111.	106.7
Benzinum. U. S	0.670	670.	69.8	1.493	1493.	143.3
Carbonic Bisulphid. U. S	1.272	1272.	132.5	.786	786.	75.5
Chloroform, Purific. U. S	1.488	1488.	155.	.672	672.	64.5
" Venal. U. S	1.470	1470.	153.1	.680	680.	65.3
Glycerinum. U. S	1.250	1250.	130.1	.800	800.	76.8
Liquor Ferri Acet. U. S	1.160	1160.	120.8	.862	862.	82.8
" " Chloridi. U. S	1.405	1405.	146.4	.711	711.	68.3
" " Tersulph. U. S	1.320	1320.	137.5	.757	757.	72.7
" Potassæ. U. S	1.036	1036.	107.9	.965	965.	92.6
" Sodæ. U. S	1.059	1059.	110.3	.944	944.	90.6
Mel	1.333	1333.	138.8	.750	750.	72.0
Oleum Adipis	0.900	900.	93.75	1.111	1111.	106.7
" Amygd. Express	0.917	917.	95.5	1.091	1091.	104.7
" Aurant. Cort	0.860	860.	89.5	1.163	1163.	110.6
" Bergamii	0.875	875.	91.1	1.143	1143.	109.7
" Caryophylli	1.050	1050.	109.4	0.952	952.	91.4
" Copaibæ	0.890	890.	92.7	1.123	1123.	107.8
" Cubebæ	0.920	920.	95.8	1.087	1087.	104.4
" Eucalypti	0.900	900.	93.75	1.111	1111.	106.7
" Gaultheriæ	1.173	1173.	122.2	.852	852.	81.8
" Gossyppii Seminis	0.925	925.	96.4	1.081	1081.	103.8
" Lavandulæ	0.890	890.	92.7	1.123	1123.	107.8

TABLE OF SPECIFIC GRAVITIES AND SPECIFIC VOLUMES OF SOME LIQUIDS.

LIQUIDS.	WEIGHTS.			VOLUMES.		
	Specific weight (water = 1) sp. gr.	Weight of 1000 cc. in grams	Weight of 100 U. S. fl. ozs. in av. ozs.	Specific volume (water = 1)	Volume of 1000 gm. in cc.	Volume of 100 av. ozs. in U. S. fl. ozs.
Oleum Limonis	0.850	850.	88.5	1.170	1170.	112.9
" Lini	0.936	936.	97.5	1.068	1068.	102.5
" Menth. Pip	0.900	900.	93.75	1.111	1111.	106.7
" Morrhuæ	0.920	920.	95.80	1.087	1087.	104.4
" Olivæ	0.916	916.	95.4	1.092	1092	104.8
" Ricini	0.960	960.	100.0	1.042	1042.	100.0
" Rosmarini	0.900	900.	93.75	1.111	1111.	106.7
" Sassafras	1.091	1091.	113.6	.917	917.	88.0
" Sesami	0.918	918.	95.6	1.089	1089.	104.5
" Terebinthinæ	0.862	862.	89.8	1.160	1160.	111.4
Spir. Ætheris Nitros. U. S	0.824	824.	85.8	1.214	1214.	116.5
" Frumenti	0.920	920.	95.8	1.087	1087.	104.4
" Vini Gallic	0.930	930.	96.9	1.075	1075.	103.1
Syrupus. U. S	1.310	1310.	136.4	.763	763.	73.3
Tinct. Ferri Acet. U. S	0.950	950.	98.9	1.052	1052.	101.1
" " Chlorid. U. S	0.980	980.	102.1	1.020	1020.	98.0
Vinum Album. U. S	1.000	1000.	104.17	1.000	1000.	96.0
" Rubrum. U. S	1.000	1000.	104.17	1.000	1000.	96.0

ON THE KEEPING QUALITIES OF SNOW WATER.*

BY GEO. W. SLOAN, INDIANAPOLIS.

Query No. 2.

"It has been said that if snow formed in any month but April be melted and bottled, the water will become ropy; that snow which falls during April, upon the contrary, will furnish water which will remain limpid the summer through, and which can be used by pharmacists and photographers. Experiments upon this subject are desired."

In order to reply to the above query the following course was taken. Snow was collected upon the following dates, viz: November 26, 1882; December 17, 1882; January 1st, February 17th, March 28th, and April 23, 1883.

The snow in each case was carefully gathered from an open lot about fifty feet from any building, collected in a clean porcelain vessel, and after carefully covering with a napkin, it was placed in a position where the temperature was sufficient to melt it slowly. The resulting water was then filtered through white filter paper into glass-stoppered bottles of the capacity of one pint, which bottles had been carefully cleansed, and the final rinsing being with distilled water; after filling with the snow water, they were set aside in a closet where the average temperature was 78° F.

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* Read at the Fifth Session.

The appearance of the bottles with their contents was observed frequently, yet without disturbing them, until July 15th, when they were carefully compared with each other. To the eye there was no apparent difference, all the samples being limpid, and there was no sign of ropiness in either.

The bottles were all well shaken after having first removed the stoppers to allow access of air; they were then returned to the closet and allowed to remain for ten or twele days, when another observation was made, with similar results to the former, except there was a slight sediment in part.

Through the kindness of my friend John N. Hurty, M. D., an analytical chemist, who has given the examination of water considerable attention, I am enabled to give the following detailed examination of the foregoing samples of snow waters:

ANALYSIS OF SNOW WATERS—PARTS IN 100,000.

	Nov.	Dec.	Jan.	Feb.	Mar.	April.
Appearance.	Bright slight sediment.	Bright flocky sediment.	Bright flocky sediment.	Bright flocky sediment.	Bright ab'ndant sedimnt	Bright slight sediment.
Odor when heated 100° F	None.	Slight.	Slight.	Slight.	Musty.	None.
Total solid matter	6.2	9.2	10.2	8.5	6.4	5.
Organic and volatile matter	4.2	4.7	6.7	4.5	3.1	.5
Chlorine in chlorides	.2	.4	.7	.8	.4	.2
Ammonia	None.	None.	None.	.068	.076	None.
Oxygen absorbed in half hour at 80° Fah.	0	.0476	.111	.130	.054	.0272
Oxygen absorbed in 12 hours at 80° Fah.	.0015	.0787	.157	.228	.275	.0458

Microscopical.—Every sample contained more or less sediment, and flocculent matter, March and December being especially rich, November and April being almost free. With 375 diameters the sediment proved to be a fine white powder, and silicious appearing granules, insoluble in acids. By far the greater proportion of the sediment appeared to the naked eye as brown flocks, but under the microscope proved to be minute filamentous algæ, of a brown-purple color. The plants were composed of cylindrical cells, having attached simple and branched filaments, all being covered with a very delicate gelatinous coat.

The total solid matter, which was estimated by evaporating 100 cc., as the table shows was about one-half organic and volatile matter. The organic and volatile was estimated by ignition, the non-volatile being iron, alumina, calcium, and alkalies, as sulphates, chlorides, and nitrates, silica also being present.

The chlorine was estimated with a centi-normal silver nitrate solution on 100 cc. of the water which had been concentrated to 50 cc. Potassium monochromate, free from chlorine, was used as an indicator. The ammonia was estimated by colorimetry with Nessler's solution. The oxygen absorbed in 1/2 and 12 hours was estimated by digesting with solution of potassium permanganate, and titrating with sodium thiosulphate. Potassium iodide and starch water were used as indicators.

As will be observed, these processes are those recommended by the Society of Public Analysts of Great Britain, for determining the purity of drinking water.

It should be stated that the foregoing experiments were made from snow collected in the heart of a city containing about ninety thousand inhabitants, where the larger part of the fuel used is bituminous coal, and that there was left upon the paper after filtration a very apparent film of coal soot. The snow was collected as soon after falling as practicable.

The following table will show the condition of the atmosphere during the fall of snow:

Date.	*Mean Temperature.*	*Condition of Atmosphere.*
1882.		
Nov. 26.	32.7	A light rain preceded the snow.
Dec. 17.	21.0	Snow not preceded by rain.
1883.		
Jan. 1.	25.7	" " " " "
Feb. 11.	33.7	" " " " "
March 28.	35.6	" " " " "
April 23.	39.5	From 11.40 a. m., rain and sleet; from 12.10 p. m., heavy soft flakes of snow.

These data were not taken at the time, but have been furnished by the U. S. Signal officer at this station.

From the foregoing experiments it would seem that it is not the month of the year, but the condition of the atmosphere at the time of the falling of the snow, to which must be attributed the variation of snow water; for it is shown that when the atmosphere has been previously washed by a rain just preceding the snow, the water from that snow shows a minimum of impurities, whereas that obtained from snow not preceded by rain shows an increase. As the month of April probably gives the phenomenon of rain changing into snow more frequently than some of the other months, it was quite natural the fact should be attributed to that month, without ascertaining the real cause.

Indianapolis, Sept. 1883.

PRECIPITATES IN FLUID EXTRACTS, TINCTURES, ETC.*

BY J. U. LLOYD.

Let us now consider another class of precipitates—a class which forms upon or above the surfaces of our tinctures and our fluid extracts. At a first glance, it may seem inconsistent to speak of a precipitate forming above the surface of the liquid from which it is derived, and yet when the subject of precipitates is studied we find that a substance of this nature is a common phenomenon.

We will first examine a surface precipitate, by which we mean the film that results when certain tinctures or fluid extracts are permitted to remain quietly, even if in securely sealed vials. In many instances, especially where the solvent is diluted alcohol and the material from which the tincture was made contained oils or resins in abundance, this film will be formed quickly and repeatedly.

We may refer to tincture of capsicum (Pharm. 1870), or to a tincture of lobelia seed or of colchicum seed, each made with dilute alcohol, and we all know that other examples of this nature are numerous in partly filled bottles closely sealed.

In speaking of evaporation we usually assume that exposure to the atmosphere is a necessary condition, and apparently assume that evaporation cannot proceed in closed vessels when the vapor is prevented from escaping. Such a view, however, we find is not consistent with a careful study of the phenomenon, for we are constantly meeting with examples where evaporation progresses in closed vessels. We may cite the evaporation of water in a steam boiler, for the water continues to volatilize as the heat increases, and of course the pressure increases in proportion to the amount of water in the form of vapor. Under the same conditions and in a like manner, other volatile liquids will evaporate.

It is not necessary that the liquid should be in a state of active ebullition in order that it should evaporate rapidly. Often when conducting distillation by means of a glass retort it will be observed that a perfectly tranquil liquid will evaporate and distill very fast. When the temperature increases, a certain increase of evaporation follows from the surfaces of our tinctures and fluid extracts, even if the bottles are air-tight. Let it be assumed that we are now considering a tincture which is fully saturated with some substance, and it will be found in this case that the increase of temperature will readily produce a film over the surface of the liquid, or small aggregations of solid matter, providing the increase of temperature is not followed by a corresponding increase in solvent power of the liquid. In case the tincture is made with dilute alcohol, and contains oils or resins, this evaporation decreases the solvent power the liquid has for these substances, because the alcohol evaporates more rapidly than the water.

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* Read at the fourth session.

As a consequence a film quickly forms over the surfaces of such liquids. In these cases the precipitate will not re-dissolve, and upon agitation of the contents of the bottle it frequently settles to the bottom of the liquid. This operation may have another influence upon the formation of precipitates, for it alters the solvent power of the solution, and other substances may in consequence be thrown down.

We shall not dwell upon this latter phase of the subject, because our paper read before the society at its last meeting was mainly devoted to the consideration of the class of precipitants which results from alterations of the menstrum. We find, in accordance with the foregoing statement, that directly and indirectly a class of precipitates may be formed upon the surface of a liquid, even though the liquid is in a closed vessel, and that this class results from surface evaporation. Under such circumstances, when the temperature is reduced, a proportional condensation of vapor follows; and thus by alternate changes of temperature we may have repeated evaporations and condensations, which, under certain conditions of the liquid, will be followed by small surface precipitations. The amount of insoluble matter thus produced is not large, as a rule, and yet it may be sufficient to render a pharmaceutical preparation unsightly.

We have as yet advanced little if any proof to demonstrate that the precipitate which we have considered resulted from evaporation. In order to bring forward the line of argument whereby we were led to make the assertion concerning the method of its production, we will first consider the class of precipitates to which we have referred as forming above the surface of the liquid. As an introduction, permit us to call attention to a related phenomenon familiar to all pharmacists, but which perhaps has escaped general attention and investigation. During the evaporation of solutions, every operator must have noticed the incrustations of certain substances which form upon the sides of the dish just above the surface of the liquid. This often creeps upward until with certain salts it will extend to the rim of the dish, even though the original solution occupied but a small portion of the space within the dish. This upward growth results mostly from an absorption of the solution by the lower edge of the incrustation, and a transference of it by capillary attraction to the upper edge, where it evaporates, and upon evaporating deposits the unvolatile portion. This heightens the layer of incrustation by the amount of solid matter deposited; and as such an incrustation is usually crystalline in form, and porous, the newly deposited matter acts like a sponge, and carries other portions of the solution from beneath upward. This continual absorption from beneath and evaporation from above causes a constant deposition of insoluble matter over the surface of the incrustation and upon its upper edge, until, as we have remarked, the creeping incrustation may reach the rim of the dish, and even lap over it. To such an extent do we have this phenomenon exemplified by certain substances, that when we attempt to evaporate to dryness the solutions of some salts, the larger portion of each will be found upon the sides of the dishes, providing the solutions were not constantly stirred and the sides of the dishes continually scraped while evaporation progressed. As illustrations we may refer to solutions of chloride of ammonium in water, or of salicylic acid in alcohol, the former best shown by evaporation with artificial heat such as a steam-bath, the latter spontaneously.

If the salts are impure, it will be often found that most of the impurity will have separated, forming, if darker than the salt, a colored layer upon some portion of the incrustation, or else remaining in the bottom of the dish. The position of the impurity depends upon the relative solubilities and crystallizing powers of the substances which compose the mixture; but as this section of the subject is foreign to the question in which we are now directly interested, we will not permit ourselves to be diverted.*

Most pharmacists must be familiar with the phenomenon which we have presented; if not, dissolve a little salicylic acid in a small portion of alcohol, pour the solution into a small evaporating basin, and permit the alcohol to escape spontaneously. The incrustation will be formed in the manner we have named, and is characteristic of others of the same kind. In continuing the study of such an incrustation, it will be found that extraneous circumstances retard or encourage its growth in certain directions, so that it is not always the case that the deposit rises in an even line above the surface of the liquid. The rate of progression is facilitated or interrupted by such conditions of the surface of the dish as the defective glazing of a portion of it, or of a soiled surface. Chief among the agencies which render its growth irregular, however, will be found unequal temperatures. If the temperature of one side of the dish above the solution is raised, it will be found that the incrustation will flow† upward very rapidly upon the inner surface of that portion of the dish, and it is but natural to expect such a result, because increase of temperature produces a more rapid evaporation, which must be followed by a faster deposition of unvolatile matter. Some salts possess this creeping property to a remarkable extent, while others will scarcely rise above the surface of the liquid. Mixtures may be made of salts, each salt being perfectly soluble, the mixture dissolved and evaporated, and it will often be found that each salt has selected a location, and there may be a fair line of demarcation between them. As an illustration, one ounce each of chloride of sodium and bromide of ammonium were mixed, dissolved in water, and evaporated to saturation. The solution was then poured into the bottom of a dry evaporating basin, and evaporated to dryness without agitation. It was then found that the creeping incrustation had reached the rim of the dish, but for about two-thirds the way from the top it was thin, and entirely different in appearace from that beneath. Portions of the material were then taken separately from near the top of the dish and near the bottom, and severally boiled with alcohol until the residue remained insoluble, using the same proportion of alcohol for each. The specimen from near the top of the dish weighed before treatment with alcohol 14.8 grains; after treatment, 0.1 grain, thus showing that very little chloride of sodium was present. The specimen from the bottom of the dish weighed 18.0 grains before treatment with alcohol, and 11.2 grains after treatment, showing that this was more than half chloride of sodium. Hence we find that by a process which may be compared with dialysis, the bromide of ammonium had purified itself from the chloride of sodium until only about two-thirds of one per cent. of the latter salt remained. The evaporating dish which we present as specimen F will illustrate this property. A mixture of salts, equal parts of bromide of ammonium and chloride of sodium was made, dissolved, and poured into the dish. The dish was then placed in a drying room and the liquid evaporated by exposure to a temperature of 180° F. Attention is called to the fact that upon the bottom of the dish crystals of chloride of sodium are in masses and distinct, while above the surface of the original liquid none are distinct to the naked eye. Notice also the

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* Advantage may be taken of this fact in the purification of some substances, and perhaps if studied carefully may prove of actual value in the separation of bodies for which as yet, we have imperfect methods. Some of the glucosides or other principles of plants which are associated with glucose, seem to dissolve in all solvents which will dissolve glucose, and to be thrown out of solution by the same precipitants; and it may be that a study of the principle to which we have alluded may give us a method of some value in these cases. We have taken advantage of it in the separation of coloring matters, and as an illustration call attention to the incrustation of salicylic acid within the evaporating basin (specimen A), which contained the solution of a dark-colored commercial salicylic acid, but which after spontaneous evaporation has separated from the impurity, which is mostly deposited in a district ring on the rim of the incrustation.

† Some may object to our use of the term *flow* in this example, since the material is a solid, and we have only spoken of the formation of this crust by the deposition of matter upon its surface or on the upper edge. The experiments of Agassiz among the Swiss glaciers show that they constantly move onward like a river. Perhaps it may also be argued that most solids are plastic enough to yield under a slow, constant pressure. We

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have seen it recorded that steel may be punched like a piece of putty if the punch is harder than the steel, and the pressure immense, and very gradually applied. In our case the creeping solution crystallizes throughout the interstices of the incrustation as well as upon its surface, and the pressure of this constantly forming and interlaced mass of crystals causes a flow of the entire mass, so that in reality most of the mass moves upward. The stopper of a bottle can readily be lifted by a solution which crystallizes between it and the neck of the bottle, or the pressure may even fracture the glass. In this connection it may not be out of place to refer to the destruction of buildings by the fibrous roots of plants which separate the stones, and we read that some of the immense stones of the ancient buildings of Eastern countries are being toppled from their positions by fibrous rootlets. Lastly, one of the most irresistible forces known to us is that of water in the act of freezing, and this is simply a crystallization.

warty excrescences which have been thrown up in certain places along the side of the dish and upon the surface of the crust, these being especially numerous just above the original surface line of the liquid. These excrescences, although formed immediately upon the edge of the liquid, or upon the crust which formed over the surface of the liquid, contain but a small proportion of chloride of sodium. The one which has been divided, yielded but 0.55 of a grain of chloride of sodium in 9.75 grains of material removed. We scarcely consider it necessary here to consider the interchange of elements which might result from double decomposition of the two original substances.

We cannot consume further space at this time with this section of our work, but the results are interesting and well worthy of attention. The experiments we have carried on show that this character of crystalloids and colloids should be studied in connection with dialysis. We must accept that the deposition of the incrustations we have just considered results from evaporation of the solution, and that these incrustations form above the surface of the liquid; however, we shall produce further evidence after a time. There is a close connection between the examples which we have just given, and a class of precipitates or incrustations that form above the surface of our tinctures and fluid extracts; and the explanation by which we have illustrated the formation of the incrustation upon the inner surface of the evaporating basin will account for the formation of these.

We now arrive at a point where we can best introduce the fact that precipitates will and do form above the surfaces of our tinctures; and in continuing the study we shall call attention to a phenomenon which is familiar to all pharmacists, but which perhaps for this very reason escapes general investigation. It is not unusual for interesting every-day phenomena to escape our observation, or if noticed to scarcely receive the courtesy of a thought from us; and it may strike some as a useless waste of time when we call attention to the fact that around the inside of the bottle, and apparently on the surface line of most tinctures and fluid extracts or similar solutions, there may be found a deposit of insoluble matter. This deposit may vary in height from a mere line to the quarter of an inch, and it may extend partially or entirely around the bottle. If a portion of the contents of the bottle be drawn off, the stopper replaced, and the bottle permitted to stand again, after a greater or less period of time it will be found that another deposit has occurred which resembles the first. This experiment may be repeated until the entire contents of the vial will have been abstracted, and with each fractional decrease of the surface of the liquid a ring of insoluble matter will remain to mark the position the surface occupied.

Upon close observation it will be found that this deposit is not directly upon the surface of the liquid, but is separated from it by the width of that amount of fluid which is attracted up the sides of the glass, and that the upper edge of the film of liquid barely reaches the lower edge of the layer of precipitate. In studying the formation of this deposit, it will be found that it presents itself first as a line along the edge of the film of liquid which is attracted up the side of the bottle, and that this line widens and thickens in time until finally it assumes the form of a deposit which may be made to grow many inches in width, and of considerable thickness. It will be observed that the growth is upward, and that it is usually if not always above the extreme surface of the liquid, even of that portion which is attracted by the side of the bottle.

Here we have a phenomenon which merits attention. The deposit will occur in closely-stopped vials or in sealed tubes. It will proceed to form whether the liquid be fully or partially saturated with the solid, and it is not unusual to find the most characteristic precipitate (for it is a true precipitate) in dilute preparations such as ordinary tinctures. It must be remembered that tinctures and fluid extracts are not simple solutions of a single substance, but they are complex. Although the dilute solution of a very soluble salt will not produce a deposit, a certain amount of material being necessary in such instances, a tincture or fluid extract will usually contain some substance which may easily be thrown out of solution, and after this is once deposited it may be insoluble in the liquid which held it.

In explaining the afore-named problem, we desire first to call attention to the fact that such deposits of solid matter can only be formed from substances derived from the liquid, and that they may occur when the liquid which is placed in the bottle is a perfect solution and free from solid particles. They will form as quickly under these conditions as though the liquid contained undissolved particles of matter, and they are not, therefore, an aggregation of the solid particles which pre-existed in the solution. In explaining this phenomenon we will repeat that it is well known that deposits will follow when solutions evaporate, and in studying the precipitate under consideration we naturally assume that the precipitate resulted from evaporation of the liquid in the manner we have explained the formation of the scum upon the surface of the liquid in a closed vessel. However, the production of any considerable deposit would necessitate the evaporation of considerable liquid; and since we are now speaking of liquids in air-tight receptacles, it does not seem reasonable to suppose, from the ordinary view of the matter, that deposits of any considerable weight could have been formed in this manner. However, under favorable conditions, large amounts of solid matters have accumulated in small vials under our observation, and above the surface of the liquid, and it was demonstrated that they were formed by continuous evaporation.

In speaking of the films which form upon the surface of liquids in air-tight bottles, we referred to the fact that changes in temperature were followed by repeated evaporations and condensations; and now we speak of continuous evaporation and condensation. In order to explain the subject and uphold our argument, it is necessary to show that continuous evaporation and condensation progress under ordinary circumstances. The fact that such a phenomenon is taking place, will be apparent to all who will revert to changes which constantly occur in our presence. Place a few pieces of camphor in a closed bottle, and place the bottle in the vicinity of a warm object, where the temperature will be unevenly applied, the bottle being warmer on one side than it is on the other. In a moderate length of time it will be noticed that crystals of camphor will appear on the cooler portions of the inner surface of the bottle, those portions opposite the warm object, and these will increase in size and number until the entire surface of the cool portions of the bottle will be covered with a frost-work of camphor. Notice the camphor bottles on the shelves in our apothecary shops, and in cold weather it will be found that the surface which is exposed to the warm air of the room will be free from crystals, while that toward the wall (if an outside wall) will be covered. Pour a little water or alcohol into a bottle and place the bottle near a stove, or a steam-pipe where the heat is regular, and in a short time the inner surface of the bottle, opposite the warmth, will be covered with moisture. This deposit will increase steadily until drops of condensed liquid will form and trickle down the cool inner surface of the bottle, but during all of this time the warm side of the bottle will remain dry. This evaporation from the surface of the liquid and the subsequent condensation will continue during an indefinite period, and as long as the uneven temperature is maintained.

Thus we have continuous evaporation and continuous condensation under circumstances which occur in most if not all of our stores; for it is almost if not always an impossibility to find a location where our bottles will be exposed to an even temperature on all sides. In following this line of investigation, in order to form an idea of the actual evaporation under these circumstances, we prepared three glass U-tubes all of the same sized tubing, one-half inch bore, and each arm was six inches in length. One of the arms of each tube was then filled with water and both arms were securely sealed. The tube was then inverted (curved part upward) and fastened in such a manner that the filled arm of each was against a thick piece of felt, which in turn rested against an upright pipe through which the alcohol distilling was passing. By this means we obtained a regular temperature for both arms of each tube, the highest temperature being applied to the filled arm. In a short time the empty arm of each tube was moistened with condensed vapor, and in a moderate period of time it contained a layer of water. This increased in depth and the water in the opposite arm diminished in proportion, until the warm arm of each tube was empty and the other full. Self-registering thermometers fastened against each arm showed a temperature of 104° F. for the warm arm of each tube and a temperature of 94° F. for the cooler arms, or a difference of 10° F. One arm of a tube was then filled with alcohol, the arm of another with water, and the third with sulphuric ether. The tubes were fastened in a manner similar to the last experiment, in the positions previously occupied, and all were submitted to the conditions before recorded. In twenty-two and one-half hours all of the ether (six inches in depth) had passed from the warm arm into the cool arm. Ten-sixteenths of an inch of alcohol and five-sixteenths of an inch of water evaporated and condensed during the same period. Thus it will be seen that the rate of transference was governed by the boiling points of the liquids, and other experiments with other liquids gave no variation to the rule.* We think that the foregoing experiments conclusively point to the fact that evaporation is constantly progressing from the surfaces of the liquids in our shop-bottles, although we do not notice the result, because the condensation which follows is in the same vessel with the evaporating liquid, and there is no change in surface level.

Let us now revert to the ring of deposit which we have said was formed just above the surface of the liquid. The creeping incrustation of our evaporating basin may be compared with it, and the explanation which has been advanced concerning the formation of the former will answer for the latter. Both are deposited by the evaporation of the solution, and both incrustations increase in height by the capillary attraction the deposit possesses for the liquid beneath. In continuing our investigations, it will be found that causes which effect the deposition of this material on the sides of an open evaporating dish will also influence, and in like manner, the deposition of the deposit on the side of a closed vessel. Upon those portions of the dish where the temperature is greatest the largest amount of incrustation will form. If the bottle be placed in such a position that the heat will be upon one side, the incrustation will grow more rapidly within this portion of the bottle; and by applying the heat in a line from the bottom to the top of one side of the bottle, the deposit may be made to extend several inches above the surface of the liquid on that side of the bottle without appearing elsewhere. This fact is exemplified by the specimen which we present, A, whereby on eight ounce glass stoppered bottle was about half filled with a satured solution of chloride of sodium and then securely stoppered, and sealed with a rubber cap, and then fastened against an upright pipe through which alcohol was distilling. In fifteen minutes a line of deposit appeared upon the inside of the bottle, just over the liquid, and against the pipe. This line increased in height, width and thickness until, when the bottle was removed (thirty hours) it was as is shown by our specimen, two and one-half inches in height and two inches in width at the widest portion; it was oval at the top and cut off at the bottom by the surface of the liquid. (Figs. 1 and 2).

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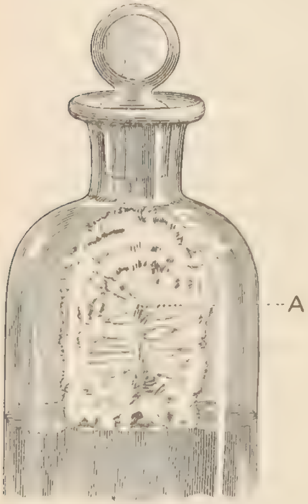
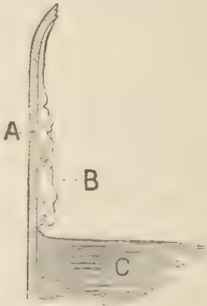
* We cannot carry the result of this set of experiments farther without deviating from our subject. We may briefly note, however, that under all circumstances, where there is an uneven temperature below the boiling-point of the liquid, evaporation progressed from the warmer side and condensation followed on the cooler. All that is required is a difference in temperature, and the condensing temperature of one experiment may be the evaporating temperature of another. Where there was the greatest difference in temperature we met with the most transference of liquid. There is considerable food for investigation in this direction.

FIG. 1.



This represents an incrustation of chloride of sodium as it formed over the liquid. A, indicates the center of the incrustation through which the absorbed liquid seemed mostly to pass and then branch off to form the spreading incrustation.

FIG. 2.

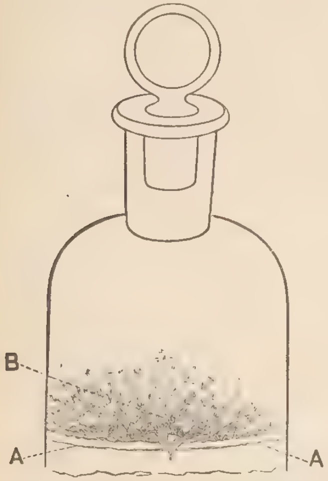


Section sketch of incrustation represented by Fig. 1. A, the bottle. B, the incrustation. C, the liquid.

Specimens B, C and D show the deposit which formed in bottles containing severally tincture of dulcamara, tincture of sanguinaria, and tincture of fucus vesiculosus. These bottles stood in an ordinary prescription case, which was situated six feet from a stove, the back of the case toward the stove. It will be noticed that the incrustations appear on the sides which are opposite the label, and these positions were warmed through the back of the case by the stove. (Figs. 3 and 4). Thus we find that under conditions where the bottle is heated evenly, a deposit is likely to appear in a ring on the glass above the entire surface of the liquid. If the bottle is unevenly heated, however, as is often the case where our shelf bottles are exposed to a cold wall on the one side and the warm air of the room upon the other, the deposit will likely be greater on the side opposite the wall. If upon the contrary the bottle be in a cool room and next to a flue or warm wall, the deposit is reversed, and it appears next to the wall, in which connection we call attention to specimen

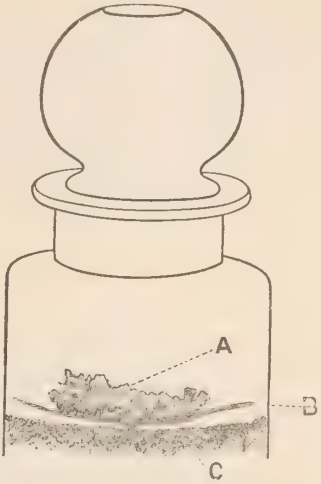
E wherein a securely stopped bottle of saturated solution of chloride of sodium was placed on a shelf against a flue. The deposit appeared upon the back of the bottle, as shown by our specimen.

FIG. 3.



Incrustation which formed above the surface of tincture of dulcamara. AA. Surface of liquid ; B, the incrustation.

FIG. 4.



Incrustation which formed above the surface of tincture of fucus vesiculosus. A, heavy green incrustation, which rested upon the lighter colored B. C, brown precipitate which formed upon the entire inner surface of the bottle beneath the liquid. The surface of the liquid is shown by the top of this sediment.

In order to determine the amount of evaporation and of condensation in sealed vessels under circumstances such as I have named, exclusive of the experiments with the U-tubes, we carried on several series, arguing that a comparison of the weight of the incrustation with that of the solid matter in the entire solution, would give the amounts of liquid which evaporated during the formation of the incrustation. The result demonstrated that the evaporation is rapid, and that large amounts of liquid volatilize and condense, especially when there is considerable difference of temperature between the sides of the bottle. As an illustration, a bottle was half filled with alcohol and then a layer of iodide of potassium was placed in the bottom of the bottle. The stopper was replaced and the bottle sealed with a cap of rubber. The bottle was then placed near a pipe which contained distilling alcohol, and in a moderate length of time it was found that the incrustation above the liquid was of considerable height and thickness. This incrustation was removed, dried, and the weight shown to be 60.25 grains. The alcoholic solution was then weighed (1090.9 grains) and evaporated, showing a residue of 47.35

grains. In accordance with this determination, it would have required 1327.9 grains of alcohol to have dissolved the incrustation (60.25 grains) or nearly one and one-fourth times the entire amount of alcohol within the bottle.

There are some phases of precipitation yet to be considered, and which are closely related to those we have presented to this Society during the past three yearly meetings. These are interesting within themselves, and would lengthen this paper beyond endurance were we to presume to introduce them at this time, It is also true that the precipitates which we have considered in this paper present some characteristics which we have neglected to mention, but rather than weary our members we shall defer their discussion until a future day.

UPON AN IMPROVED PROCESS WITH APPARATUS FOR MANUFACTURING FLUID EXTRACTS ON A LARGE SCALE*.

BY WM. M. THOMSON, PHILADELPHIA. †

As an introductory remark, on submitting this paper to an association comprising as it does many of the most progressive and practical minds of the times, permit me to express the hope that the subject matter contained therein may be deemed worthy, not only of their earnest attention, but more particularly meet with full and free discussion; as it can only be, by each one cheerfully contributing his mite of information, to the general fund of knowledge, on any scientific subject, that the greatest advancement can therein be attained.

The principle of "Percolation" or "Displacement," has occupied for a number of years the attention of some of the best minds in the profession, especially in this country where it takes precedence of all methods in preparing the various tinctures, extracts, etc., is sanctioned and advocated by the National Pharmacopœia; besides having called forth some of the most able articles in pharmaceutical literature.

Believing that much diversity of opinion exists at the present time, in regard to the superiority, if any, of the various applications of the system, occasionally brought prominently into notice, each claiming respectively much merit, whether it be in the form of pressure, "mechanically,"

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* Read at the fifth session.

† The author exhibited at the meeting a large drawing to which the letters of reference in this paper refer; but he omitted to furnish either a cut or a drawing for making one. Nevertheless the paper is printed as read, the main features of the apparatus being readily understood.—*Permanent Secretary.*

"hydraulic," "pneumatic," or by "vacuum"—differences of opinion even upon the shape of the percolator, some calling for high narrow columns, others again, the opposite, one of whom in an article on "Syrups" contributed to a leading Journal of Pharmacy using the following language: "The percolator should be *broad and shallow—high columns in any percolation are a dangerous delusion.* In most percolations *the height of the column should not exceed its diameter*"— the writer is of the opinion that no more appropriate opportunity than the present could be found, when the subject is once more brought into notice, to secure if possible, a free and full expression of opinion thereon, based more particularly on practical experience, rather than on theory.

With these brief remarks, the subject of the paper will now be described.

The apparatus consists of three separate and distinct parts, and differs in this respect and also in its operation from all others.

The upper chamber A constitutes the "Reservoir" for the "Menstruum" and "Compressed Air," thus acting in the double capacity of a "vacuum and compressing chamber," receiving the menstruum by creating a vacuum therein, subjecting this menstruum immediately afterwards to a pressure of 3 or 4 atmospheres (equal to 45–60 lbs.), and *retaining the same under compression* until required, differing in this respect from any other method; and the advantages resulting therefrom constituting one of its most important features. The middle vessel B is the "Displacer," having an upper and lower diaphragm, between which the ground drug previously dampened is firmly packed—the flat iron cover bolted on and connected to the reservoir by union-coupling.

The lower vessel C is the "Receiver" or "Vacuum Chamber." which also serves the double purpose of receiving the percolate and maintaining a steady vacuum upon the "Displacer," to which it is attached in a similar way to the "Reservoir." The apparatus complete is operated as follows: The drug ground, say 40 or 60 fine, and dampened with a portion of the menstruum to be used, is firmly packed in the "Displacer" B, to within an inch or so of the top-level, and the iron cover securely bolted on. The "Reservoir" A is then attached. tap E closed, F opened and a vaccuum produced therein; tap E is now opened and F closed; by so doing a partial vacuum is obtained in the tissue of the packed drug (the object of closing tap E while exhausting A being to prevent withdrawal of portions of menstruum and volatilizable constituents from the drug, which would otherwise pass through the air-pump and be lost, as must inevitably be the case, when the vacuum is produced directly upon the surface of the drug). Tap E is again closed and F opened, allowing balance of menstruum to enter the "Reservoir" A (there being no necessity for the "Receiver" remaining idly below the "Displacer," while the drug therein is macerating, when it can be doing service underneath another, which is ready to be operated upon, explains my reason—on the plea of economy in apparatus alone—for creating a vacuum in the upper chamber, the "Reservoir," in place of in the "Receiver," thus enabling one Receiver to answer for two or more "Displacers," according to the length of time allowed for maceration. When sufficient time has elapsed for the drug to macerate in vacuo, the menstruum remaining in the "Reservoir" is subjected to a pressure of three or four atmospheres, and a vacuum at same time produced in the "Receiver" C; taps E and K are now opened simultaneously, thus bringing to bear upon the already softened tissue of the drug, the full and immediate effect of two powerful forces in combination, by means of which thorough and speedy exhaustion is accomplished.

One very important advantage gained in this method of procedure is the full and constant effect of the compressed air upon a column of menstruum forcing it through the drug mass, the construction of the apparatus allowing a body of liquid to be constantly between the drug and air, which is readily done by closing tap E, when the menstruum has left the "Reservoir" A, and creating again a vacuum therein, into which water or more menstruum if found advisable, is drawn and again subjected as before to compression and forced upon the drug; whereas, by simply applying the compressed air directly upon the surface of the drug mass with no intervening liquid much, if not all of its effect is lost, inasmuch as the granular nature of the drug offering little or no resistance to its force, the air rapidly descends through the mass, being accelerated by the vacuum from below, without fulfilling its important office.

Another peculiar feature in its construction is the practicability of its operation being entirely *reversed*, without changing it, should in any case the percolate fail in being saturated; then A becomes the "Receiver," or "vacuum chamber" and C the "Reservoir" and "compressed air vessel," the same method of procedure forcing the percolate upward through the drug again, and which can, if so desired, be returned as before.

EXTRACT OF MALT.*

BY J. U. LLOYD.

When substances of this kind were introduced, some five years ago, we were induced by the demand created to make a preparation of malt. In looking at the matter, it then seemed to us that the desideratum was a pharmaceutical preparation which should embody the soluble constituents of well malted barley. We therefore arrived at the conclusion that there was little, if any, necessity for a deviation from the regular line of fluid extracts, although the process for making malt extract in Germany resulted in a substance of the consistence of thick honey. Our view of the subject has not been changed. The most practical and feasible process for extracting the desirable principles from malt, in our opinion, is that of percolation. The product represents all of the valuable constituents of malt, if the menstruum is adapted to this extraction. The finished fluid extract is pleasant to the taste ; it is rich in diastase.

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* Read at the Sixth Session.

The action of malt on warm gelatinous starch, whereby the starch is quickly changed into dextrin and sugar, has been familiar since malt liquors have been used. Payen and Persoz (1833) first gave us the name *diastase*, which they applied to the fermentive principle of germinating malt. This substance is also found in other germinating seeds, sprouting potatoes, etc. This (diastase) is now generally accepted as the desirable principle of malt, although the glucose certainly is useful as a food, and to us it is by no means certain that other substances than diastase are not present and valuable.

Extract of malt as introduced into this country, and which, as far as we can learn, was first officinal in the German Pharmacopœia, was made by bringing a decoction of malt to the boiling point, and then evaporating it to the consistence of a thick extract. Such in substance was the process, and the appearance and characteristics of the preparations sold originally in our country under this name induces us to believe that they were then made in this manner. Until one year ago we do not know that in this country particular attention had been directed to the comparison of values of malt extracts in accordance with their powers to convert gelatinized starch into dextrin and glucose. The perishable nature of diastase was well understood, and yet the makers of malt extracts seemed scarcely to consider it as a prominent factor. An extract of malt made a few years ago, which was preserved by us in an original bottle, compared with one of recent date made by the same manufacturer, showed a great difference in appearance and in properties. This preparation is that of one of the largest manufacturers. We have every reason to believe that the makers endeavor to produce an unexceptionable preparation, and we feel assured that they were as likely as any to have been among the first to consider the value of diastase. Hence it is that we may well believe Mr. Cowdrey to have first directed prominent attention in this country to the ease with which an *extract of malt* may be dispossessed of its diastase. In his paper read before this Association at its last meeting, he stated that a temperature of boiling completely destroyed it. This statement has since been supported by our own experiments and by those of others. It is true, also, that a temperature of from 160° Fah. to 180° Fah. will destroy diastase in a very short time, and any continued application of heat at or above 130° Fah. will, within a moderate period, render it inactive. Hence it is that we now doubt the advisability of applying any heat to a preparation of malt, and we certainly have every reason to believe that pharmacists generally will always be debarred, through want of proper facilities, from preparing an active malt extract, unless it be a fluid extract.

In the paper of Mr. Cowdrey, and as illustrated by his experiments, it was stated and shown that 4 drachms of a viscid-like extract of malt could quickly convert into dextrin and glucose five (5) drachms of starch which had been boiled with water.* This conversion of gelatinous starch into glucose we have also easily accomplished by means of an equal bulk of fluid extract of malt, although we do not claim that it is desirable to introduce a process into the pharmacopœia to represent a proportion of crude material to finished product different from that of the other fluid extracts. It is for the purpose of suggesting a formula for making such a preparation (fluid extract of malt) that we have written this paper, for in the literature which we have at our command on this subject, although the fact is shown that heat will destroy diastase, and that an extract can be made to contain diastase, any reference to the method of preparing such an extract is omitted.

To prepare a fluid extract of malt which will represent as nearly as practical one part of malt to one part of the finished product, we have recently followed the process adopted by us with some other substances which will not bear the application of heat. Tall cylindrical percolators should be used, and a menstruum composed of a mixture of one part of alcohol to four parts of water.† The ground malt is moistened with this menstruum, and after one hour is packed carefully into the percolator, and not too firmly. The remainder of the menstruum is then added, and when the percolate appears the exit is closed, and maceration conducted for twenty-four hours. Then the percolate is slowly withdrawn until it is equal in weight to three-fourth (¾) the amount of malt employed. This product is placed in a tall vessel, permitted to settle and then decanted. This decanted liquid is the finished fluid extract. The specimen which we now exhibit was prepared after this process.

In presenting this paper we trust that we will not be considered as participants in the malt controversy which has more or less agitated the pharmacists of some sections of our country during the past year. The substances offered, as far as we know, under the name Malt Extracts, and which our pharmacopœia recognizes as a malt extract, are entirely different in appearance from the preparation to which we refer. Our object is simply to bring before the Association a process which can be used by pharmacists with limited conveniences. Any process embodying the application of heat which we have investigated, according to our late experiments, tends to destroy the diastase, and when by evaporation at a gentle heat the viscid-like extract is obtained it will generally be found that as far as the diastase is concerned it is in less amount bulk for bulk than in the liquid before evaporation, even if it be not altogether wanting. Hence it is that we believe the simple process of percolation is best adapted to the wants of pharmacists generally, and we think such should be the officinal process for making malt extract.

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* Mr. Cowdrey only exhibited such an extract. He did not give the process by which it was made.

† We have found during our experiments that if less amount of alcohol is used occasional fermentation follows. Hence it is that we suggest the above named proportion.

PETROLATUM IN THE OFFICINAL OINTMENTS.*

BY JOSEPH P. REMINGTON.

Petrolatum, the new officinal ointment base, was probably the subject of more animated discussion in the long series of debates occurring in the last Committee of Revision and Publication of the Pharmacopœia than any other preparation. The fact that it was a mixture, being composed of hydro-carbons of the paraffin and olefin series, probably ranging from $C_{16}H_{34}$ to $C_{32}H_{66}$, and from $C_{16}H_{32}$ to $C_{27}H_{54}$, and that its physical properties depended to a considerable extent upon the relative proportion of olefin constituents, contributed to the necessity for thorough study and discussion ; but the need that was recognized for a non-oxidizable substitute for lard, and the conviction that the cosmolines, vaselines, deodorolines, saxolines, petrolines, etc., in their then condition of varying composition, would not be acceptable in a national authority, was the prime reason for fixing a standard which could be readily reached, and would be essentially practical. After prolonged consideration it was finally decided to fix the melting point but slightly above that of the best forms of the commercial article, for experience had shown that excellent results had been obtained, therapeutically, from a petrolatum having a melting point of 40° C. (or 104° F.), and a firmer petrolatum could be readily produced by incorporating yellow wax with it, although care is necessary in the production of this firmer ointment. To ensure a homogeneous compound it must be stirred thoroughly and continuously after it has commenced to congeal, whilst upon the larger scale mechanical stirrers are recommended. At the present time petrolatum can be had of excellent quality, and fully up to the requirements of the Pharmacopœia, in large quantities cheaper than good lard, and the reduction in price due to competition is still going on, and thus one practical obstacle to its general employment in ointments is overcome. It is not the intention of this paper to enter into a discussion of the therapeutical superiority of petrolatum as a base for ointments. Its very extensive use in this connection by physicians compelled the Committee of Revision to introduce it into the Pharmacopœia; and if at the time of the decision an adequate supply, made by different manufacturers, and not proprietary in its character could have been assured, it would have probably been directed in the formulas for the ointments. The next Revision will in all probability require its use in most of the officinal ointments. With the view of obtaining some experience in its general use, the following series of formulas was devised, in which petrolatum is substituted for lard or other animal fat in each one of the officinal cerates and ointments, and one-pound samples are herewith submitted to the Association for inspection; the formulas will be accompanied by comments when deemed necessary.

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* Read at the Sixth Session.

CERATUM—*Cerate.*

Yellow wax thirty parts, petrolatum seventy parts; melt them together and stir constantly until cool. The color of cerate made in this way is of a light yellow color, and of course would not be recognized as officinal simple cerate. It is nevertheless an excellent dressing, and will retain its properties unimpaired a greater length of time than officinal cerate.

CERATUM CAMPHORÆ—*Camphor Cerate.*

Camphor liniment, three parts; olive oil, twelve parts; cerate (made with petrolatum), eighty-five parts; mix the camphor liniment and the olive oil, and incorporate with the cerate. This cerate was introduced as the base of cerate of subacetate of lead, and when made from petrolatum is more permanent than the officinal. A better and simpler formula, in some respects is as follows: Powdered camphor, one part; petrolatum, ten parts; cerate (made from petrolatum), one hundred and eighty-nine parts. Warm the petrolatum until it liquifies, then dissolve the camphor in it and incorporate with the cerate.

CERATUM CANTHARIDIS—*Cantharides Cerate.*

Cantharides in No. 60 powder, thirty-five parts; yellow wax, twenty parts; resin, twenty parts; petrolatum, twenty-five parts. Use the officinal process.

CERATUM CETACEI——*Spermaceti Cerate.*

Spermaceti, ten parts; yellow wax, twenty-five parts; petrolatum, sixty-five parts. Melt together the spermaceti and then add the petrolatum and stir the mixture constantly until cool. Not white, but much more permanent than the officinal.

CERATUM EXTRACTI CANTHARIDIS—*Cerate of Extract of Cantharides.*

Cantharides in No. 60 powder, thirty parts; resin, fifteen parts; yellow wax, thirty-five parts; petrolatum, thirty-five parts; alcohol, a sufficient quantity. Use the officinal process.

CERATUM PLUMBI SUBACETATIS—*Goulard's Cerate.*

Solution of subacetate of lead, twenty parts; camphor cerate (made from petrolatum) eighty parts. Mix them thoroughly. This cerate is more permanent than the officinal, and in practice will be found to be very efficient in alleviating acute, active cutaneous inflammation, at times being successful when the officinal ointment does not afford immediate relief. It is yellowish white in color.

CERATUM RESINÆ—*Resin Cerate.*

Resin, thirty-five parts; yellow wax, fifteen parts; petrolatum, fifty parts. Melt together at a moderate heat, strain through muslin and allow it to cool without stirring. The substitution of petrolatum in this cerate is probably not much of an improvement from a therapeutic point of view. As stimulation is the object sought it would, however, not be objectionable. When made without stirring, a semi-translucent, handsome ointment is produced.

CERATUM SABINÆ—*Savine Cerate.*

Fluid extract of savine, twenty-five parts; resin cerate (made from petrolatum), ninety parts. Use the officinal process.

UNGUENTUM—*Ointment.*

Petrolatum, eighty parts; yellow wax, twenty parts; melt the wax and add the petrolatum gradually; then stir the mixture constantly until cool. A yellowish white ointment, which is firmer in consistence than the petrolatum, having the higher melting point. It is well adapted for use in the firmer class of medical ointments.

UNGUENTUM ACIDI CARBOLICI—*Ointment of Carbolic Acid.*

Carbolic acid, ten parts; ointment (made from petrolatum), ninety parts; mix them thoroughly. This ointment seems to have less tendency to separate than that made by the officinal process; therapeutically there can be but little difference in them.

UNGUENTUM ACIDI GALLICI—*Ointment of Gallic Acid.*

Gallic acid, ten parts; benzoinated petrolatum, ninety parts; use the officinal process. Very little benefit was observed when petrolatum was treated with benzoin, the peculiar change in the odor of petrolatum which occurs when it is long kept, has been observed in benzoinated petrolatum almost to as great an extent as in simple petrolatum which was exposed for the same length of time; the odor is undoubtedly modified by the presence of the benzoin, but the petrolatum is not changed or protected by it. This ointment is undoubtedly an improvement on the officinal one.

UNGUENTUM ACIDI TANNICI—*Ointment of Tannic Acid.*

Tannic acid, ten parts; benzoinated petrolatum, ninety parts; use the officinal process. This is a better ointment therapeutically than the officinal

UNGUENTUM AQUÆ ROSÆ—*Cold Cream.*

Petrolatum, sixty parts; white wax, ten parts; rose water, thirty parts; use the officinal process. The addition of a small quantity of oil of rose improves this ointment greatly. Although it would be probably useless to attempt to dispense this improved ointment in ordinary counter practice as cold cream, because of its yellowish color, there is no question of the superiority of the petrolatum cold cream as a practical dressing and emollient.

UNGUENTUM BELLADONNÆ—*Belladonna Ointment.*

Alcoholic extract of belladonna, ten parts; diluted alcohol, six parts; petrolatum, eighty-four parts; rub the extract with the diluted alcohol until uniformly soft, gradually add the petrolatum, and mix thoroughly. An improvement over the officinal ointment therapeutically.

UNGUENTUM CHRYSAROBINI—*Chrysarobin Ointment.*

Chrysarobin, ten parts; petrolatum, ninety parts; rub the chrysarobin with the petrolatum gradually added, until they are thoroughly mixed. A better ointment may be made, however, by digesting the mixture in a water bath and stirring thoroughly as it cools.

UNGUENTUM DIACHYLON—*Diachylon Ointment.*

Lead plaster, sixty parts; petrolatum, thirty-nine parts; oil of lavender, one part; melt together the lead plaster and petrolatum at a moderate heat; then, having permitted the mass to become partly cool, incorporate with it the oil of lavender and stir constantly until cold. This ointment is a decided improvement on the officinal formula; it keeps much better, does not separate, and is not so adhesive on account of the want of uniformity in the quality of olive oil permitted by the Pharmacopœia. Physicians often complain of the irritant effects produced by the use of this ointment as ordinarily dispensed. The use of petrolatum would undoubtedly do away with these difficulties, and a smooth, non-irritating and more permanent ointment than the officinal be produced.

UNGUENTUM GALLÆ—*Nutgall Ointment.*

Nutgall in No. 80 powder, ten parts; petrolatum, ninety parts; rub the nutgall with the petrolatum gradually added, until they are thoroughly mixed. For therapeutical reasons this is preferable to the officinal

UNGUENTUM HYDRARGYRI—*Mercurial Ointment.*

Mercury, four hundred and fifty parts; petrolatum, three hundred and fifty parts; compound tincture of benzoin, forty parts; mercurial ointment, one hundred parts. Mix the mercury with the tincture of benzoin in a mortar, add the mercurial ointment (which should contain fifty per cent. of mercury), and triturate the mixture until globules of mercury cease to be visible; then add the petrolatum and yellow wax previously melted together and partially cooled, and continue the trituration until globules of mercury cease to be visible under a magnifying power of ten diameters. This is believed to be a better ointment than the officinal, for both lard and suet are dispensed with, the necessary firmness being imparted by yellow wax. The process is practically more rapid than the officinal because suet is almost invariably granular in its character, and prolonged trituration is necessary to break down the granules. The disagreeable odor always present in suet is, of course, absent in the improved preparation, whilst rancidity is effectually prevented.

UNGUENTUM HYDRARGYRI AMMONIATI—*Ointment of Ammoniated Mercury.*

Ammoniated mercury in very fine powder, ten parts; petrolatum, ninety parts. Rub the ammoniated mercury with the petrolatum, gradually added, until they are thoroughly mixed. Preferred for therapeutical reasons.

UNGUENTUM HYDRARGYRI NITRATIS—*Citrine Ointment.*

The practice which has been indulged in to some extent of making citrine ointment from petrolatum is one which should be condemned. The well recognized therapeutic effects caused by the use of this ointment are probably due not only to the presence of the acid nitrate of mercury, but to the elaïdin produced by the action of nitric acid upon olein. Now it has been shown by Schorlemmer that hot nitric acid attacks octane, one of the higher members of the paraffin group, and that succinic acid is one of the products; but it is yet to be proved that the resulting compounds, if any, produced by reacting upon petrolatum with nitric acid, under the circumstances detailed by the officinal process, are valuable. Indeed, it is very probable that the chemical changes are slight, and it is very fair to assume that totally different products must result when a mixture of paraffins is treated with nitric acid, than when the olein in an animal oil is so treated.

Practical results seem to verify this view, for the attempts to produce ointment of nitrate of mercury from petrolatum, which have been made by various investigators from time to time, have proved failures, a spongy yellowish mass, filled with bubbles of gases, resulting from decomposition, and ultimately turning brown, is the result. The present officinal process, if strictly adhered to, gives an excellent product, and for the reasons above given, the writer recommends it in preference to all others.

UNGUENTUM HYDRARGYRI OXIDI FLAVI—*Ointment of Yellow Oxide of Mercury.*

Yellow oxide of mercury in very fine powder, ten parts; ointment (made from petrolatum, see unguentum), ninety parts. Rub the oxide of mercury with the ointment, gradually added, until they are thoroughly mixed. Preferred to the officinal for therapeutical reasons.

UNGUENTUM HYDRARGYRI OXIDI RUBRI—*Ointment of Red Oxide of Mercury.*

Red oxide of mercury in very fine powder, ten parts; ointment (made from petrolatum, see unguentum), ninety parts. Rub the oxide of mercury with a small quantity of the ointment, until a perfectly smooth mixture is obtained; then gradually add the remainder of the ointment, and mix thoroughly. More permanent than the officinal, and preferable therapeutically.

UNGUENTUM IODI—*Iodine Ointment.*

Iodine, four parts; iodide of potassium, one part; water, two parts; petrolatum, ninety-three parts. Use the officinal process. A dark greenish-black ointment is produced, which is probably not inferior to the officinal; the advantages of the use of petrolatum here are not so apparent as in some of the other ointments.

UNGUENTUM IODOFORMI—*Iodoform Ointment.*

Iodoform, in very fine powder, ten parts; petrolatum, ninety parts. Rub the iodoform with the petrolatum gradually added until they are thoroughly mixed. Preferable on therapeutic grounds.

UNGUENTUM MEZEREI—*Mezereum Ointment.*

Fluid extract of mezereum, twenty-five parts; petrolatum, eighty parts; yellow wax, twelve parts. Melt together the petrolatum and wax, with a moderate heat, add the fluid extract, and stir the mixture constantly until the alcohol has evaporated, then continue to stir until cool. The advantages of petrolatum in this ointment over lard are not very apparent, as it is used as a stimulating application.

UNGUENTUM PICIS LIQUIDÆ—*Tar Ointment.*

The use of petrolatum here is not recommended, although if desirable, a mixture of yellow wax and petrolatum, of the consistence of suet, could be used.

UNGUENTUM PLUMBI CARBONATIS—*Ointment of Carbonate of Lead.*

Carbonate of lead, in very fine powder, ten parts; petrolatum, ninety parts. Rub the carbonate of lead with the petrolatum, gradually added until they are thoroughly mixed. Preferable, therapeutically, to the officinal.

UNGUENTUM PLUMBI IODIDI—*Ointment of Iodide of Lead.*

Iodide of lead, in very fine powder, ten parts; petrolatum, ninety parts. Rub the iodide of lead with the petrolatum, gradually added, until they are thoroughly mixed. A bright orange-colored ointment, which darkens on the surface when exposed.

UNGUENTUM POTASSI IODIDI—*Ointment of Iodide of Potassium.*

Iodide of potassium, in fine powder, twelve parts; hyposulphite of sodium, one part; boiling water, six parts; petrolatum, eighty-one parts. Dissolve the iodide of potassium and the hyposulphite of sodium in the boiling water, in a warm mortar; then gradually add the petrolatum, and mix thoroughly. This ointment is of a lemon yellow color, but shows a disposition to separate on keeping, due to the presence of the water; it should only be made as it is needed.

UNGUENTUM STRAMONII—*Stramonium Ointment.*

Extract of stramonium, ten parts; water, five parts; petrolatum, eighty-five parts. Rub the extract with the water until uniformly soft, then gradually add the petrolatum and mix thoroughly. Very much preferable to the officinal in the treatment of hemorrhoids.

UNGUENTUM SULPHURIS—*Sulphur Ointment.*

Sublimed sulphur, thirty parts; petrolatum, seventy parts. Rub the sulphur with the petrolatum gradually added until they are thoroughly mixed. Probably no better than the officinal.

UNGUENTUM SULPHURIS ALKALINUM—*Alkaline Sulphur Ointment.*

Washed sulphur, twenty parts; carbonate of potassium, ten parts; water, five parts; petrolatum, sixty-five parts. Rub the sulphur with the carbonate of potassium and the water, gradually add the petrolatum and mix thoroughly. Preferable on therapeutic grounds to the officinal.

UNGUENTUM VERATRINÆ—*Veratrine Ointment.*

Veratrine, four parts; alcohol, six parts; petrolatum, ninety-six parts. Rub the veratrine with the alcohol in a warm mortar until dissolved, then gradually add the petrolatum and mix thoroughly. This ointment is much darker in color than the ointment formerly officinal, due to the complete solution of the veratrine. When made from petrolatum it is probably more efficient than when made from lard, because of its more rapid absorption.

UNGUENTUM ZINCI OXIDI—*Ointment of Oxide of Zinc.*

Oxide of zinc, twenty parts; petrolatum, eighty parts. Rub the oxide of zinc with twenty parts of petrolatum, previously melted, until the mixture is perfectly smooth; then add the remainder of the petrolatum and mix thoroughly. This ointment does not equal the officinal in appearance; it is not white, nor does it have the pleasant balsamic odor due to the benzoin, but when used to allay irritation, as in acute eczema, the ointment made from petrolatum will frequently be preferred.

PHARMACEUTICAL NOTES.*

BY J. W. COLCORD.

Several articles during the past few months, copied from English pharmaceutical journals, calling attention to the styptic properties of plantain leaves—*Plantago major*—having attracted my attention, I determined to try a few experiments when opportunity offered. Having a shiftless neighbor whose yard produced a bountiful crop of the article, I was easily enabled to secure an abundant supply for my experiments. Believing that better results would be obtained from fresh plants than from dried, I expressed the juice from them by means of an "Enterprise mill," obtaining about sixteen fluid ounces of juice from three pounds of leaves. The juice was of a light green color, very turbid, evidently caused by a large amount of chlorophyll. Setting aside four ounces of the filtered liquid for further experimenting, I packed the residue from the press into a conical glass percolator and exhausted with dilute alcohol, evaporating the percolate in a water bath to two ounces, mixing with the twelve ounce of expressed juice and adding two ounces of alcohol. This preparation, which I call a fluid extract, represents virtually equal parts, by weight, of the dried plants. It is of a dark-brown color, with a marked odor of the recent plant, and so far, after standing three months undisturbed on my shelves, shows no sign of precipitation.

My next experiment was a mixture of equal quantities of the expressed juice with glycerin. At the present time, after standing three months, the mixture is clear and bright, with no sign of precipitation. This, I think, promises to be the most efficient preparation, and will prove valuable as an injection in the treatment of leucorrhœa, hemorrhages, and similar disorders.

Experiment number three was made with equal parts of the juice with alcohol, and number four with three parts of the juice with one part of alcohol.

In a short time quite an amount of precipitate was observed in both samples, in about equal proportion, which was removed by filtering through paper about one month after making; and neither has shown signs of precipitation since, with the result of bright, clear, light brown liquids.

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* Read at the Sixth Session.

Of their therapeutic values as styptics I have not had sufficient trial to form an opinion, although, as far as I can judge, they have proved satisfactory. While writing this article, a cook from a neighboring restaurant, with a finger sliced off in a potato slicer, exposing the bone, came in for treatment. Having bandaged, I applied the glycerate, which soon stopped the profuse bleeding. Giving her a small bottle of it to apply subsequently, I asked her to report to me in two or three days; and, on reporting, I found a healthy granulation presenting. Its styptic properties are undoubtedly due to tannic acid, as in all the tests I have been able to make prove this to be the case. The readiness with which it can be obtained in the summer renders it a valuable adjunct, undoubtedly, to the materia medica of the country practitioner or house-wife for stopping hemorrhages in simple wounds, the bruised leaves applied directly usually proving sufficient for the purpose. As to whether it will prove sufficiently valuable to add to our list of pharmaceutical preparations will require longer and more extended experiments.

THAPSIA PLASTER IN THE TREATMENT OF WEEPING SINEW.

Having had several cases of weeping sinew in my family and among my friends, and seeing but little relief experienced from the various methods of treatment, such as rupture by a blow, showering with cold water, etc., a cure, if at all, being effected only after long suffering, I was dismayed, a year or more ago, to find myself a victim. The pain was such that I could scarcely use my hand. Casting about for some remedy, by a lucky chance, for this only it was, I applied a small piece of thapsia plaster, securing it with a bandage around the wrist. To my exceeding gratification, in a few hours the pain subsided, and at the end of twenty-four hours I removed the plaster. There was considerable tetter with intense itching for a day or two, but I was not troubled again for several months, until another strain produced another smaller one, which quickly yielded to the previous treatment, and for a year I have had no further trouble in this respect. I have recommended this treatment in quite a number of cases since, with the happiest results.

GLYCERIN AS A PREVENTIVE OF CRYSTALLIZATION OF HONEY.

Having, for several years, had considerable trouble and loss in keeping pure strained honey, on account of its tendency in a short time, particularly in warm weather, to crystallize, I have been ready for any remedy that was feasible. One lot that I purchased in the comb and strained myself, soon became almost worthless from this cause. Some two months ago, I had a small lot that I found crystallized when wanted for use, although I had taken the precaution to cork tightly and put in a cool place in the cellar. It occurred to me to see what would be the result from melting and adding a small amount of glycerin; placing the bottle in a warm bath, I soon had it melted, and added one ounce of glycerin to about one and one-half pounds of the honey, setting aside to cool. It has shown no sign of recrystallization as yet, and I am just using the last of it. I can see no objection to this on the score of adulteration, or any harm from its use.

In making simple syrup, I have occasionally found it crystallized in the bottom of the bottle, causing some trouble to remove, and several times have found some chemical change, which has caused an unpleasant odor, which I have not at all times been able to obviate, although using distilled water and the purest sugar obtainable. Have not as yet had an opportunity to try the effect of glycerin, but think it might prove beneficial, and in no way objectionable. Have been accustomed to add a small amount to my beef, iron and wine, for a long time, and find it prevents souring, and in a large measure, precipitation.

LABORATORY NOTES.*

BY WM. M. THOMSON, PHILADELPHIA.

During an experience of many years, manufacturing largely fluid extracts, etc., for different establishments, I scarcely know of any part of the operation which is the source of more trouble, delay, and annoyance, than the recovery of alcohol from exhausted drug tissue; and which is a matter of absolute necessity, few drugs affording better examples than buchu No. 60, senna No. 50, squills No. 40 fine. It is customary with some, in cases like this, to loosen up the packed drug, with a large fork, just before applying the water; others again empty the percolator, throwing the mass loosely into a larger vessel, and there displacing it. Either of these plans are good in their way, but are laborious, tedious, and cause—especially the last one—a serious loss of that very article which they are endeavoring to save, namely the alcohol; and, consequently, cannot be recommended.

To overcome, in a great measure, these difficulties, I at one time had made a percolator *in sections*, and found it to operate well; each section having a diaphragm, the drug is packed therein to within two or three inches of the top, permitting a layer of liquid being constantly on the surface of the drug. When the drug has yielded the requisite amount of fluid extract, and it becomes necessary to displace it with water, the advantages of this somewhat peculiar construction are clearly shown, it being only necessary to remove each section, after thorough depletion by the water, and thus reduce very materially the amount of substance to be operated upon: the sections, as they are emptied, can be used to build up, so to speak, another percolation in which to place another drug—this method I prefer to call "Sectional Displacement," in contra-distinction to "Fractional" or "Re-percolation."

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* Read at the Sixth Session.

When made upon a large scale, and operating upon large quantities of drug, it has this advantage also, that in case, at any time, the flow of percolate should, from any cause, cease, any section can be withdrawn, and if found to be the one at fault, repacked and replaced in a short time, without necessitating the removal or disturbance in the least of the balance already packed, and percolation resumed satisfactorily. But, to return to the previous subject, various articles have, at different times, been proposed to obviate this difficulty—sand, coarse gravel, sawdust, and chopped straw. All of these have been tried with more or less satisfactory results; but none have rendered more solid satisfaction than the article to which I would now be pleased to call your attention, and which I trust others will be induced to give a trial, when a favorable opportunity presents itself, the material alluded to being "rice hulls" or "rice chaff," as it is sometimes called. Not susceptible of being acted upon by either alcohol or water, it may well be considered an inert substance—water, cold or boiling hot, does not soften it or cause it to swell, and even steaming it exerts no influence whatever upon it. Consequently, for those who possess large dreg-stills, into which free steam in jets is blown, it promises to be a very desirable article, as it can be intimately mixed with the several lots of finely ground drug residue, before being placed in the still, when it will be found to greatly facilitate the operation of recovering the alcohol contained therein, by keeping the steamed mass in a much more permeable and divided condition than could otherwise be done. Ground say No. 16 or 20, and mixed thoroughly with any No. 60 or 80 powder, to be displaced, with a weak menstruum, it will be found of much value, especially so, when the time comes for displacement by water.

Since in this method of manufacturing fluid extracts, the drug is subjected to great pressure upon the lower diaphragm, it became a matter of much concern as to what inert, suitable substance could be satisfactorily placed thereon to sustain the drug, prevent its being forced through the openings, and at the same time admit of a *free flow of* liquid. Something was necessary which would not yield, and become dense and impermeable; and, after experimenting with a variety of substances, I must acknowledge having as yet found nothing to equal "rice hulls," which answer the purpose admirably.

There is another matter to which I desire to call attention, a matter applying particularly, however, to those who manufacture on a large scale, necessitating the use of large stills, in which "*gaskets*" or "*rings*," are indispensable to form a perfectly tight-fitting joint and prevent the loss of alcoholic vapor during distillation. These "*gaskets*" are usually made of "rubber and cloth insertion," others of "pure rubber," and some are "fibrous." They are sold by weight, varying from 90 cents to $1.50 per pound, according to quality, width, etc., and consequently are rather expensive necessities, especially when large in diameter, and require frequent renewing, as is the case when subjected to much heat.

This being another article my process requires—some of them over two feet in diameter—and with the view of economizing as much as possible, I concluded to try an experiment which I had reason to believe would yield satisfactory results. Purchasing 5¼ feet of ¾ inch three ply steam hose, having sewed the ends together, the ring was placed upon a vacuum chamber and retained there for several days, tightening it up occasionally; and what I now show you is the article referred to, after having been in daily use for nearly one year. It cost eighty cents and a little labor, whereas an ordinary "gasket," 18 inches inside diameter, 5/16 inch thick, three ply, 1½ inches wide, weighing 1¾ lbs., corresponding to this one, would come to at least one dollar and fifty cents—a clear saving of seventy cents.

It is true this one has not been subjected to heat, yet I find in using them upon steam-distilling apparatus, that they are equal to the best and superior to many of the regular "gaskets." Prolonged heat does affect them, but not more so than "gaskets" generally causing them to soften, become sticky, and peel. To overcome these objections, I first wrap them with good, stout, close wove sacking in bands, which I find keeps them in good condition, and if properly taken care of, will last much longer than might be supposed. I also show you a small piece of the "rubber steam hose" from which this gasket was made.

WHO IS RESPONSIBLE FOR ADULTERATION?*

BY ROBERT H. COWDREY, PH. G.

The query, "Is it desirable that pharmacists be held personally responsible for the quality of the goods which they dispense?" is seemingly but another way of putting the question of who is responsible for the adulteration of drugs. In order to answer this question intelligently, it will be necessary to look for the causes of adulteration. In every case in which the writer has approached the wholesale dealer on this subject, the reply has been, "We have to supply adulterated drugs, because the trade demand them; they so demand when they ask us to furnish them drugs at a lower price than the prime or unadulterated article can be sold for. They tell us the price they will pay, and we furnish an article as pure as can be had for that price." One member of a prominent firm stated that no firm could live that would sell only strictly pure drugs. This is the case as represented by the jobber.

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* Read at the Sixth Session.

The retailers are divided in opinion, the same varying in proportion to the character of the men. The majority, however, say that if they could obtain pure drugs by paying more than the market price, they would willingly do so; some others, and I am pleased to say but a small proportion, will purchase the cheapest drugs from the cheapest house. The line of contact between these retailers is very sharply defined, and but few members are numbered outside of these two classes. The class that would pay more for pure drugs may be rightly termed pharmacists; the others, druggists As it would manifestly be unfair to hold the whole number responsible for the actions of the few, even though admitting their presence in the body, I will only refer to the pharmacists.

The probability is that the whole truth is not told in either the case of the jobber or the retailer. In the case of the jobber, for the reason that competition with his neighboring jobbers is as great an inducement for him to sell adulterated drugs as is the demand of the retailer for them; and that many drugs are sent to the retailer that are not pure, where pure was ordered, and for which the price of pure was paid.

As an illustration, take the case of the samples of powdered rhubarb, examined by Geo. W. Hayes for Messrs. Allaire, Woodward & Co.'s prize; the price ranged from thirty-five cents to one dollar per pound—the prices paid, in the opinion of Mr. Hayes, bearing no relation to the purity of the drug, the jobber in each case representing the drug as being pure, strictly pure, or guaranteed pure.

In the case of the retailer, while he may be willing to pay more than the market price for pure drugs, he demands stronger proof of their purity than the simple advance in price. In the majority of cases, the expressed opinion was that whatever the price paid, the drug always came out of the same barrel. I also find that there is not one retailer but what desires to get his drugs at the very lowest price at which they can be obtained. So much for the causes of adulteration.

Now, let us find who does the adulterating; and in order not to make this paper too lengthy, I will use the word adulteration as applying to only those cases in which the drug is reduced below the standard strength with intent to defraud. The drug-miller does some; the jobber, we are led to believe by his argument, "that he has to," does some; and in some other cases, the retailer does some. There then are three guilty parties, and all equally so. The law, as I am informed, would hold the one of these three in whose possession the adulterated article was found. But the query extends beyond this, and asks if the retailer should be held responsible for the quality of the drugs he sells. I have shown that in case of his being guilty of adulteration, he not only should be, but, under the law, he is held responsible. In case of his purchasing an adulterated drug, knowing the same to be so, he is liable under the law, and justly so. I am of the opinion, though not certain that such is the case, that having so purchased, he would be held solely liable for the adulteration, as against the one from whom he purchased. In case he orders and receives what he believes to be a pure drug, and it is found to be an adulterated one, is it desirable that he be held responsible for its quality? The answer is, No. And this answer is further supported by the law, as is shown by the case of Mr. Henry Fulle, who was tried on the charge of selling adulterated cream of tartar. This so-called cream of tartar contained about ninety-five per cent. of terra-alba, and five per cent. of tartaric acid. He was convicted and fined. Mr. Fulle appealed to the Supreme Court. Judge Cowing, in summing up the evidence in this case, made the following statement and decision.

"There is no positive and direct evidence that the defendant was guilty of any criminal intent or culpable negligence in selling the cream of tartar. On the contrary, the unavoidable conclusion is that the defendant was desirous of obeying the law, bought the cream of tartar in the open market, paid the highest price, and asked for the best article. The evidence falls very short of making the defendant a criminal. I think that the judgment of the Special Sessions should be set aside, and it is so ordered."

Judge Cowing afterward said: "If the Board of Health is desirous of following up this line of investigation, I think the manufacturers should be directly attacked. When a man buys packages of goods in the open market, from a reputable dealer, and pays the highest price, he cannot, I think, justly be held for selling adulterated goods with criminal intent." We see in this case, where it is admitted that the article was sold as a medicine or food, the selling admitted, and it proved that the article was adulterated, that a complete defence is buying in the open market, asking for the best article, and paying the highest price.

If we take the position that the query asks, Is it desirable that the pharmacist be held liable, in order to force the pharmacist to become educated so that he can detect adulterations in drugs that are sold to him for pure? the answer must be, No. In the first place, the penalty is too severe for the benefit sought; and secondly, it is impracticable, as the time consumed, even granting that the ability is not wanting, in examining each new lot of drugs, would be all out of proportion to the annual income of the pharmacist. In the opinion of the writer, there is not a pharmacist or chemist in the world that could enter a retailer's store and correctly report on the purity of his drugs. If this is true, then certainly it is folly to ask that all pharmacists should be able to test the articles entering their doors. The best that can be hoped for is that pharmacists will voluntarily so educate themselves as to be able to detect the grosser frauds.

A very common article in each drug store is lard, and yet, in the recent reports of chemical analysis of twelve samples of lard, the composition and adulteration in each sample of which was known, we find that the chemists reported that eighty-five per cent. lard and fifteen per cent. tallow was pure lard, that eighty per cent. lard, ten per cent. cotton seed oil, and ten per cent. tallow was pure lard. One chemist found beef tallow in the pure lard, and cotton seed oil where there was none, and failed to find cotton seed oil where there was some. The only one that came anywhere near the truth being one who confessed his inability to analyze four of the samples, and reported traces of cotton seed oil in one sample that did contain some.

The writer was favored with the opportunity of witnessing part of this work, and if he had depended upon the confidence with which results were reported as the work progressed, he would have been led to believe that chemistry in the hands of experts, always produced reliable results.

I think the foregoing is sufficient to show that a pharmacist should not be held responsible for adulteration upon the part of a chemist, unless the chemist's ability had been tested by samples of known composition, being submitted to him to report upon at the same time as the suspected article. I therefore answer this query by saying No, and believe with Judge Cowing, that if adulteration is to be punished, the manufacturers, or any one else who adulterates, should be the one who is held responsible.

The man who knowingly adulterates human food, drink, or drugs, is an enemy to his race, and should be treated as such. He is simply a human wolf, fattening upon the bodies of his fellows, and deliberately poisoning them for the purpose of making his own vile existence a little more comfortable.

II. CHEMISTRY.

ON THE PRODUCTION OF BROMINE IN THE UNITED STATES.*

BY W. J. M. GORDON, CINCINNATI, OHIO.

"*What is the present production of bromine in this country?*

In answer to this query I will state that the annual production of bromine in this country is from four hundred and fifty to five hundred thousand pounds, which is made in the following localities, and in quantities about as named :

On the Allegheny River, Pa.	70,000 lbs.
Clifton, Mason City, and Hartford City, W. Va.	110,000 "
Middleport, Pomeroy, and Coalport, Ohio	130,000 "
Kanawha, W. Va.	45,000 "
Canal Dover	30,000 "
Midland and St. Thomas, Michigan	100,000 "

Bromine exists as bromides, in the brines, or what is known as bittern, after the salt has been extracted, and the places above named are the only ones in which it has been found in paying quantities. At these places the bittern is very rich in bromides, the estimate being that for every two barrels of salt, one pound of bromine should be made. This, however, is not strictly correct, as it differs in different localities, and at wells in close proximity. The material at every salt well where bromine can be made is now worked, and the production is as large, probably, as it will reach, unless salt should be found in other places containing it ; and should this not occur, it is likely to decrease, as the manufacture of salt in some of the places named has been unprofitable, and when furnaces have given out they have been wrecked and abandoned, and this is likely to continue. The first production of bromine in this country was at Freeport, Pa., in 1846. At that time the demand was very small, and used principally in the preparation of daguerreotype plates. When this ceased, the preparation was abandoned. In 1866, when attention was attracted to the value of bromides as nerve sedatives, the manufacture was again commenced, and factories established at Tarentum and Watrous, Pa., on the Ohio and Kanawha rivers. In 1868, when these were established, the market price was two dollars per pound. Competition soon reduced it to an unprofitable figure, and for several years the average price has been about 28 cts. This country furnishes the largest proportion of bromine used. In 1870 the export from this country commenced, and since then large quantities have been shipped to European markets. Much difficulty, however, has been experienced in getting vessels to carry it ; and of late years, the principal shipments have been bromide potassium.

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* Read at the Fifth Session.

ON THE QUALITY OF COMMERCIAL IODIDE OF POTASSIUM.*

BY ALBERT B. PRESCOTT.

QUERY 16.—*Will Iodide of Potassium of foreign and of home manufacture answer the tests of the Pharmacopœia? Which averages best?*

I am indebted to the Chairman of the Committee on Queries for the *five* samples I have examined, each of which came to me in an unbroken pound package, bearing the label of the manufacturer. *Three* of the samples were of American, and *two* of European production. Of the latter, the one was British and the other was German. In sending the samples, Professor Lloyd called my attention to the fact that the European samples represented articles usually classed as "fine" or "chemically pure" goods, and sold at a price much higher than that of the American articles. Upon the manufacturer's labels, the American and British samples bore, with well-know names, no claim or specification as to the degree of purity, or grade of use, of the articles, but the German sample had the familiar inscription, "*Ph. Germ.*" From the labels, then, it is to be understood that all the articles represented in these samples were put forth, alike, for medicinal use—the ordinary use of iodide of potassium—and without claim for any higher degree of purity than medicinal uses (or pharmacopœial specifications) require. The price-lists of the German makers of pure chemicals for analytical and special purposes, usually give two grades of "Kalium iodatum," namely: "*Ph. Germ.*," and "*puriss.*," the latter article being priced only three or four per cent. higher than the former. It is true that the article professing to be merely German pharmacopœial iodide of potassium is frequently furnished and used in this country, as a "chemically pure" salt, for analytical purposes. And from occasional trials of both these German grades, during the past six or eight years, I can only say that the article marked "*purissimum*," is somewhat more likely to be fit for all uses of a chemical reagent than the article marked "*Ph. German*," while even the former is often defective. Under the imprint "*puriss.*," I have less often found an alkaline reaction, or the presence of iodate, but have frequently found chloride, and not rarely bromide. An article, trustworthy as a reagent in all uses, can only be obtained, already made, out of these grades, by selection of lots, upon special order. And cheaper grades than either of these are to some extent available for analytical uses, by careful selection—it being not very uncommon to find a lot of American medicinal iodide of potassium that is at once neutral in reaction, and free from appreciable traces of iodate, chloride, bromide, and sulphate. In view of their cost in this country, it may well be claimed that the European articles represented in these samples, are not in the market upon the same plane with the American article.* Nevertheless, we have to note that these European grades are made for medicinal use in Europe.

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* Read at the Third Session of the Thirty-First Annual Meeting of the American Pharmaceutical Association.

The query concerns only conformity to the test-limits of the Pharmacopœia. Our standard of measurement is the United States Pharmacopœia. Primarily we are to apply the tests of the U. S. Ph., 1880, and, in the way of further inquiries, secondarily, we may compare tests of the U. S. Ph., of 1870, the current Br. Ph., and the new Ph. Germ. Also, we may consult unofficial tests for their bearing upon pharmacopœial standards, and may ask discussion as to the right province of these standards.

The pharmacopœial requirements are taken in order as follows, believed to be the order of their importance:

(1) *The absence of iodate.* "The aqueous solution of the salt, mixed with gelatinized starch and afterward with diluted sulphuric acid, should not at once aquire a blue color (absence of iodate)," U. S. Ph., 1880. "Its solution, mixed with diluted sulphuric acid, and afterwards with solution of starch, gradually assumes a purple tint, which at length becomes blue. When tartaric acid is freely added to a strong solution * * * the supernatant liquid, if mixed with solution of starch, gradually assumes a purple tint, which at length becomes blue," U. S. Ph., 1870. "The addition of tartaric acid and mucilage of starch to its watery solution does not develop a blue color," Br. Ph. The watery solution (1 to 20), * * * * mixed with diluted sulphuric acid, on the addition of solution of starch, should not at once become blue," Ph. Germ. (1882). The test is often made by adding a crystal of tartaric acid to the solution of the iodide to be tested. The results by a crystal of tartaric do not differ materially from those by dilute sulphuric acid (provided the latter be quite free from nitrous acid). In doubt as to the purity of the sulphuric acid at hand, the tartaric acid crystal may well be used. The test by color of the liquid without starch is but little less delicate, though not quite sufficient for the law. Of course the result hinges on the occurrence of the color "at once," and in the Ph. Germ. test the acid is added with or immediately before the starch. Pure hydriodic acid, it will be remembered, exposed to air, and in water containing air, very soon gives

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* With present import duties, it appears that the cost of the European goods under consideration is about 100 per cent. greater than that of the American goods, each being carried in the same quantities. Sold as special goods upon small demand, the European articles cost from 130 to 150 per cent. more than the American. In a late instance, known to the writer, iodide of potassium warranted chemically pure for use in analysis, and admissible to the country free of duty for scientific purposes, was obtained by importation at a rate thirty-three per cent. higher than the rate for the standard medicinal salt of American manufacture.

free iodine. All oxysalts of iodine, hypoiodite[*] as well as iodate, are revealed by the test, and are fairly excluded by the requirement of the Pharmacopœia. Practically the test is a close one, but does not effect an absolute exclusion of iodate when no regard is given to slight tints of the starch short of the "blue color." Moreover the test should not be applied in very dilute solutions. The German pharmacopœia prudently specifies the strength of the solution (1 to 20). Biltz[†] found that in solution of 1 to 20, the addition of dilute sulphuric acid, without starch, gave a pale yellow color when only 0.1 to 0.01 per cent, of iodate was present, while in much more dilute solutions as large a quantity as 0.5 per cent. could be present before a full brown color was developed on addition of the acid. Iodate of potassium is well-known to be poisonous. Most reducing agents, including many organic bodies, liberate iodine from an iodate, and with help of an iodide all acids at once cause, as in the test, the liberation of iodine in amount six times that in the iodate.[‡] Even atmospheric carbonic acid gradually effects this change. And 1 part of potassium iodate, with excess of iodide and with free acids, furnishes 3.5 parts of free iodine. Free iodine, as an impurity in the salt in hand, or as a product in the stomach, is alike objectionable. In one method of manufacture of iodide of potassium, iodate is formed and afterward reduced. Also, pure iodide, exposed for an hour to melting heat, acquires a trace of iodate and an alkaline reaction. Manufacturers are not likely to be so careless as to neglect due reduction of iodate when this is a considerable intermediate product of their process, but they may neglect needful precautions, or additional work, to remove final traces of this impurity, especially when only such traces are formed in the method employed. When potassium iodide is manufactured free from iodate, I do not believe this impurity is ever acquired by atmospheric action in keeping, even if in solution. The pure salt is not affected by the air when dry, and when moist is affected no further than a possible very slight liberation of hydriodic acid, and then of free iodine, with corresponding formation and preservation of alkali corbonate.

(2) *The limit of Alkalinity.*—"* * * Generally * * * having a faintly alkaline reaction; but single crystals laid upon moistened red litmus paper should not at once produce a violet-blue stain (absence of more than about 0.1 per cent. of alkali)."—U. S. Ph., 1880. "Produces no change in the color of litmus, and little, if any, in that of tumeric."—U. S. Ph., 1870. "It commonly has a feeble alkaline reac-

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[*] It has been inferred that traces of salt of hypoiodous acid sometimes result from atmospheric liberation of hydriodic acid, and impart a peculiar odor, corresponding to that of the chlorinated compounds.

[†] Notizen zur Pharmacopœia Germanica (1878), p. 181.

[‡] $5KI + KIO_3 + 6HCl = 6I + 6KCl + 3H_2O$.

tion. * * * Its aqueous solution is only faintly precipitated by the addition of saccharated solution of lime."—Br. Ph. "Crystals laid upon moistened red litmus paper should not immediately give a violet-blue color."—Ph. Germ., 1882. "Giving a neutral or very slightly alkaline solution—not made turbid by lime water."—Ph. Germ., 1872. Biltz found that one-fifth per cent of potassium carbonate would cause a violet-blue color to show at once on placing a crystal upon wet litmus paper, while one-half per cent. would give a pure blue color at once, and one per cent. a deep blue color at once. Also that the lime-water test does not reveal less than one per cent. of the alkali carbonate when the solution is concentrated, and even more than one per cent. will escape recognition when the solution is dilute. It is an easy task to determine the percentage of alkali volumetrically. In so doing I prefer to weigh out 6.9 grammes of the iodide to be tested, and use decinormal solutions of acid and alkali, when each cc. of decinormal acid (beyond that taken up by the decinormal alkali) equals 0.1 per cent. of potassium carbonate. Excess of the acid is first added, from the burette, when the solution is quickly brought to boiling, and immediately titrated back to neutral point with the decinormal alkali. With phenol-phthalein as an indicator the number of cc. of acid required to take out the red color in presence of bicarbonate formed will be about one-half the number of cc. of acid required to keep the reaction acid after driving off the carbon dioxide. It may be assumed that, unless in some exceptional case, the alkali found is alkali monocarbonate. Some degree of alkaline reaction is a pretty general feature of medicinal iodide of potassium all over the world; and is accepted, and now more definitely limited by the pharmacopœias. Alkali in fractions of one per cent. probably will not be objected to by the physicians. But it must be admitted that any alkali at all is liable to be an inconvenient pharmaceutical incompatability. Nearly all iodide of potassium offered as "chemically pure" is neutral in reaction, whatever its other defects. A neutral iodide, free from iodate, if kept moderately air-dry, will not acquire free iodine from atmospheric action.

(3). *The limit of chloride and bromide.*—"If one gm. of the salt be dissolved in 10 cc. of water of ammonia [of 10%], then shaken with a solution of 1.1 gm. of nitrate of silver in 20 cc. of water, and the filtrate be supersaturated with 7 cc. of nitric acid [s. g. 1.42], no cloudiness should make its appearance within ten minutes (absence of more than about 0.5 per cent. of chloride or bromide)."—U. S. Ph., 1880. "Solution of nitrate of silver added in excess forms a yellowish-white precipitate, which, when agitated with ammonia, yields by subsidence a clear liquid in which excess of nitric acid causes no turbidity."—Br. Ph. The test required by the German Pharmacopœia of 1882 is that of our present pharmacopœia, with all quantities just one-fifth as large, but with dilution to over twice as great proportional volume, while the time is the same, and the limit is at opacity instead of cloudiness. The German test, therefore, is a little less stringent than ours. The various tests depending upon weight of silver precicitate obtained, or quantity of silver nitrate required for precipitation, or volume of a standard mercuric solution for reaction—all require very close operations, upon the perfectly dried salt, and their results are worthless if there be more than one impurity or defect present. The effect of alkali carbonate counterbalances that of chloride, or of sodium salt. Traces of chloride and bromide are very difficult to avoid in manufacture. A quantity of chloride larger than the limit renders the article deliquescent in proportion to its increase. But our present limit will no doubt be found close enough. The test-limit admits more of bromide than chloride, but cannot admit enough of bromide to pass by proportions of intentional adulteration with this cheaper salt. If it be desired to test for bromide, the iodine may be precipitated by copper sulphate, with a little ferrous sulphate or sulphurous acid, and the filtrate treated with excess of dilute fresh chlorine water (enough to oxidize any remaining iodide to iodic acid), when the test may be completed by shaking with carbon disulphide, or chloroform, for the yellow color of bromine.

(4) *Limit of Sulphate.*—"On adding to 1 gm. of the salt, dissolved in 30 cc. of water, 5 or 6 drops of test-solution of nitrate of barium, no immediate cloudiness or precipitate should make its appearance (limit of sulphate)," U. S. Ph. 1880. "20 cc. of a watery solution (1 to 20), with ten drops of barium nitrate solution, should not become turbid in five minutes."—Ph. Germ., 1882. If the salt have been found alkaline, a drop or two of hydrochoric acid is to be added.

(5) *Test for Cyanide.*—"The solution (1 to 20), with a fragment of sulphate of iron, and a few drops of ferric chloride solution, warmed, with addition of solution of soda, should not give a blue color on supersaturating with hydrochloric acid."—Ph. Germ., 1882. A possible impurity carried through the manufacture from the iodine.

(6) *Test for Sodium Salt.*—The U. S. Ph., and the Br. Ph., only demand identification as potassium salt, by precipitation of the tartrate. The German Pharmacopœia specifies that the flame color shall be violet at first—a quite severe requirement, but one sometimes justified by articles in commerce.

(7) *Test for Moisture.*—Drying to a constant weight at 100°C.

(8) *Test for Free Iodine.*—The salt will be colored. A solution shaken in a test-tube with carbon disulphide, or chloroform, will impart the violet color to the subsiding layer.

(9) *Test for Nitrate.*—Precipitate with excess of silver sulphate solution, and test the filtrate with concentrated sulphuric acid and a crystal of ferrous sulphate, for nitric acid. Adulteration with entire crystals of sodium nitrate has been noted in Europe.

(10) *Test by Insolubility in Alcohol.*—One gramme of the dried and finely pulverized salt is digested with 18 cc. of alcohol (90%), in a stoppered test-tube, at ordinary temperatures, frequently shaking, for several hours. Sulphate, carbonate, iodate, nitrate, and even much bromide, if present, will remain undissolved. The operation serves only to show gross adulterations, and any residue found must be tested qualitatively. If absolute alcohol be taken, not less than 40 cc. must be used, and the action is slow and unsatisfactory.

The following summary presents the results of the tests designated, according to details already given as numbered. The observations were taken across a test-tube of the width of *two* centimeters—a little more than ¾ inch—in the tests (1), (2) with lime water, (3), (4), and (5). In tests (1) "without starch," the same results were obtained with diluted sulphuric acid, and with a crystal of tartaric acid. In test (4), the U. S. Ph. tests were supplemented by adding hydrochloric acid, because of the alkalinity found in some of the samples, and to make the test uniform for all.

Numbers 1, 2, and 3 were the American samples; numbers 4 and 5 were the European samples. (See table opposite.)

These samples of home manufacture furnish a very small, but I believe a fair representation of the medicinal iodide of potassium of this country. Different lots of the salt, as put out by any one of our American manufacturers at different times, will certainly differ from each other materially, and perhaps differ as much as do the several samples in this examination. By taking a greater number of samples, truer averages can be obtained, and no comparison between the goods of different manufacturing houses should be based wholly on one or two samples from each, or on samples taken at one time. Of the foreign samples, I can only say that they are single instances of the pharmacopœial salt as put forth by foreign makers of high standing. It will be seen that one of the three American samples stands fully as well as the average of the European samples, and a little better than one of them. I do not present the results of tests of these few samples alone, as giving conclusive answer to the latter clause of the query, or full answer to the first clause of it. But I have no information to oppose to the bearing of these few examinations, and have had a little experience before mentioned, going to support the results here found. Therefore, I beleve it will be found that a buyer must exercise some selection in lots in order to obtain the medicinal salt of this country in as good a degree of purity as the average imported pharmacopœial article.

None of the pharmacopœial deficiencies found are very grave in character. In the most important medicinal requirement, the *absence of iodate*, or of more than traces of it, one of the samples is just upon the U. S. Ph. test-limit, and the others are standard (though No. 1 does not stand very strong in this test). In the *limit of alkali*, a requirement of

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
(1) *For iodate:*					
U. S. Ph. test, solution 1 to 20, with starch.	No color.	Purple blue.	No color.	No color.	No color.
Solution 1 to 4, with starch.	Purplish.	Pale blue.	Purplish.	Purplish.	Purplish.
Solution 1 to 20, acid without starch.	Slight yellow.	Pale yellow.	No color.	Pale straw color.	No color.
Result:	*Standard.*	*Hardly up to standard.*	*Standard.*	*Standard.*	*Standard.*
Comparison as to iodate (1 = best).	3.	4.	1.	2.	1.
(2) *For alkali:*					
U. S. Ph. test, wet litmus paper.	Deep blue.	Deep blue.	Violet blue.	Faint blue.	Violet blue.
Solution of 1 to 2, with lime water.	Precipitate.	Precipitate.	No precip.	No precip.	No precip.
Volumetric estimation of K_2CO_3.	0.74 %.	1.84 %.	0.05 %.	0.24 %.	0.04 %.
Result:	*Below standard.*	*Below standard.*	*Standard.*	*Hardly up to standard.*	*Standard.*
(3) *For chloride and bromide:*					
U. S. Ph. test.	Precipitate at once.	Precipitate at once.	Slight cloudiness at once.	Slight cloudiness at once.	Cloudiness at once.
Test for bromine.	Present.	Present.	Present.	Present.	Absent.
Result:	*Not standard.*	*Not standard.*	*Not standard.*	*Not standard.*	*Not standard.*
Comparison.	3.	4.	1.	2.	1.
(4) *For sulphate:*					
U. S. Ph. test (adding hydrochloric acid).	Cloudy in 5 m.	Prec. at once.	Prec. at once.	Cloudy in 5 m.	Clear.
Result:	*Not quite standard.*	*Not standard.*	*Not standard.*	*Nearly standard.*	*Standard.*
Comparison.	3.	4.	5.	2.	1.
(5) *For cyanide:*					
Ph. Germ. test.	No cyanide.	No cyanide.	No cyanide.	No. cyanide.	No cyanide.
(6) *For sodium salt:*					
Ph. Germ. test, flame color.	Yellow.	Yellow.	Yellow.	Violet.	Yellow.
U. S. Ph. identification of potassium.	Potassium.	Potassium.	Potassium.	Potassium.	Potassium.
(7) *For moisture:*					
Loss at 212° F. (100° C.).	1.4 %.	1.3 %.	0.6 %.	0.8 %.	0.4 %.
(8) *For free iodine:*					
The solution with carbon disulphide.	None.	None.	None.	None.	None.
(9) *For nitrate:*					
In filtrate from silver precipitate.	None.	None.	None.	None.	None.
(10) *Sensible properties:*					
Color.	White.	White.	White.	White.	White.
Odor.	Distinct odor.	No odor.	Faint odor.	Faint odor.	No odor.

less medicinal than pharmaceutical importance, the pharmacopœias have been very lax. Two samples are below the exact standard, and one just upon it. The *limit of chloride and bromide* is one more difficult for the manufacturer to control, and a margin beyond this limit is less injurious. Here none of the samples quite meet the U. S. Ph. standard. In the case of numbers 1 and 2, the presence of chloride, though probably not over 1 to 1¼% of the salt, had doubtless been the cause of the larger access of moisture found in test (7), and had thereby diminished the chemical stability of the salt. In numbers 3, 4 and 5, the slight proportions of chloride and bromide beyond the limit, may well be passed as not important. Most of the samples were found, also, with too much *sulphate*. This completes the list of the pharmacopœial deficiencies.

It is certainly desirable that our medicinal iodide of potassium should be so far improved as to be made uniform with its best portions, these being already nearly or quite conformable to the requirements of the Pharmacopœia. Especially in the important features of absence of iodate and close limit of alkali, the standard (fortunately fixed by the simplest possible of tests) may well be looked after by purchasers. Indeed, the manufacturers need the encouragement of an intelligent appreciation to enable them to eliminate deficiencies from their products. It is asking much of the honor and sagacity of men that they should devote care and capital to provide grades of purity never to be recognized by one in a hundred of the consumers. It is leaving a good deal to the manufacturers that it should ever be their part to stimulate a demand for sounder qualities of their products.

Medicinal chemicals may be tested and valued with more readiness and certainty than most other articles of commerce. The wardens of their consumption are the dispensing pharmacists. A demand for strictly pharmacopœial chemicals, an intelligent, healthful demand, if it comes at all, must come through the avenues of daily trade from dispensing pharmacists who habitually apply their own tests, value their own purchases, verify pharmacopœial standards, and know their own best business. Such a good demand will cause the distinctions of pharmaceutical purity to be attentively regarded by every class of dealers. With such a demand, the manufacturer is admonished that he may make expenditures needful for standard products.

ON THE MASHING, FERMENTING AND DISTILLATION OF GRAIN INTO WHISKY.*

BY CHAS. K. GALLAGHER, WASHINGTON, N. C.

The Spiritus Frumenti of the U. S. Pharmacopœia, the preparation intended to be used when whisky is prescribed by the physician, is a medicinal agent the value of which entitles it to much greater consideration than is usally accorded by those called upon to dispense it; and the same care should be used in selecting a pure whisky of good quality for medicinal use that is given to the purchase of other remedies relied upon for such curative properties as are ascribed to the judicious use of this class of stimulants. Usually whisky, so-called, is procured from the nearest saloon or grocery, with little thought given as to the original source of manufacture, the material from which it is made, the method used, or the subsequent adulterations to which it has been subjected in passing through the hands of different dealers before reaching the consumer.

A knowledge of these facts, coupled with close observation of the sources of supply, the "mixing," "compounding," "blending," "cutting," "plunging," and other forms of adulteration practiced by dealers in liquors licensed under the present Internal Revenue system as "Rectifiers," who, for the sum of $200 per annum, are allowed to alter any distilled spirit by one or all of the above processes that the resulting product has little of the qualities sought for by the physician in the treatment of diseases, first induced the writer of this article to give personal attention to the manufacture of a pure and standard whisky from selected grain. Samples from general stock are herewith submitted, with a description of the process and method of manufacture known to the trade as "hand made," "Sour Mash Fire Singled, and Doubled in Copper." These terms are used to discriminate a fine whisky distilled in copper stills by furnace heat, from the cheap, common spirit, made by continuous distillation in wooden or copper stills by steam; also as distinguishing the slow method of fermenting the mash, known as the "Sour Mash Plan," from the quick or "Sweet Mash" method used in the manufacture of "high wines," which, after conversion into neutral spirit, are converted into the brandies, whiskies, gins and rums sold by "Rectifiers and Wholesale Liquor Dealers," and being mere mechanical mixtures or tinctures of diluted deodorized alcohol with artificial flavorings, disguised and sweetened to deceive the eye and palate, they improve but little with age.

One of the usual methods of refining whisky is to percolate it through charcoal, which absorbs a portion of the fusel oil, and a larger portion of the light volatile oils, which give to whisky its flavor and body. After using the charcoal a few times it becomes impregnated with the fusel oil, and having a stronger affinity for the finer volatile oils than for the fusel oil, a portion of the latter passes off with each subsequent run of spirit, and is replaced with the finer volatile oils; therefore whisky refined by this process is very impure if the same charcoal is often used, as is the general custom. Another objection is that the volatile oils, and ethers, which are the very life of the spirit, are leached out, leaving an inferior spirit having few or none of the essential qualities of pure whisky, and will not improve in flavor by age, the grosser oils will become oxydized, but the flavor and body will remain wanting. "French spirit" proper, is nothing more than a re-distillation of spirit made by the above process, more effectually removing the odors of ethers and bone coal through which it has lately passed. When thus prepared it is free from all smell, and is a deodorized alcohol. The process I have used, and by means of which a pure whisky free from all poisonous substances is made, embraces the following characteristics, none of which are patented. The selection of good sound grain, and after giving proper attention to malting, grinding, mashing, and fermenting by the old sour mash plan, separating the alcohol elements by careful distillation in copper stills, by furnace heat, and purifying the *alcoholic vapor* from all deleterious substances, by passing it through a solution of permanganate of potassa in the final distillation, and observing that the distillate is not allowed to pass into the "cistern," or receiver, after it falls to 90° by Tagliabue's hydrometer, (the scale used by the Revenue Department). The resulting spirit in the cistern will stand at or about 112° to 120°, according to the manner in which the heat of the furnaces has been urged, and should be carefully reduced to 100° at 60° Temp. F., by the addition of distilled water. The samples sent are made by this process, and contain in 100 parts by weight:

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* Read at the Fifth Session.

Absolute alcohol	63.000
Volatile acids and ethers, or onanthylic acid and ether Pelargonic acid, acetone, etc	.101
Water and loss	36.899
	100.000
Extraction from the cask Fusel oil	traces.

This whisky shows by very delicate tests mere traces of fusel oil; it has an agreeable odor, and may be relied upon for use wherever an alcoholic stimulant is needed for medicinal purposes. After it has attained two years of age connoisseurs will find it to rival the most approved brands.

The Revenue laws having been complied with, the machinery connected, and the materials being at hand, proceed to prepare a first batch of yeast as follows:

Corn meal	½ bushel.	First batch.
Rye meal	1 quart.	
Barley malt, ground	1 quart.	
Boiling water	10 gals. or q. s.	

Brewers' Yeast, ½ pint, or Bakers' Yeast, 1 pint.

Gradually add the meal to the boiling water contained in a barrel, stirring constantly until a well-broken mash, free from lumps, is made. Cover it with the rye meal, and let stand about two hours, or until the temperature is about 110° F. in winter, or 85° in summer. Then add the barley malt, and break up the mash by stirring well with the mash stick, and add the yeast. Stir well, and leave to work 48 hours. It will be ready for use when it forms a head and settles down. (In a small quantity like the above, all the water can be added hot at once, and cooled by stirring to the proper temperature.) With this yeast another and larger batch is made, in precisely a similar manner, using:

Corn meal	1 bushel.	Second batch of yeast.
Rye meal	1 gallon.	
Barley malt, ground	1 gallon.	
Boiling water	16 gallons.	

Proceed to scald the corn meal contained in a hogshead, and break up the mashes as before described. Thin it with hot or cold water, as required to suit the season, so it will stand at 110° in winter, or 85° in summer. The yeast previously made, if working properly, should now be added, and water used to make the quantity in all about 80 gallons. This yeast is sufficient to start a set of fermenting tubs, and at the expiration of 48 hours, if it is working well. Weigh out 324 lbs. corn meal, 18 lbs. rye meal, 18 lbs. barley malt. When the water previously placed in the stills has boiled for a few minutes, empty 8 gallons, scalding hot, into tub No. 1, and have ready about ⅓ of the meal, which should be gradually added in portions of ½ bushel to 8 gallons water, at the same time stirring constantly. Again add 8 gallons of scalding hot water and stir in another half bushel of meal, and repeat until the one-third apportioned for that tub is used, observing to use about double the measure of boiling water for each measure of meal; less water makes harder work, but a better mash. The meal is gently shaken from a measure held high above the tub, while an assistant seizes the mash-fork and rapidly and thoroughly stirs the mixture until a smooth and even mash is made. A portion of the rye meal is now distributed over the surface, called "capping," to confine the heat, and the mixture or mass is left to stand. The tubs No. 2 and No. 3 are treated in a similar manner; and, after standing two or three hours, the mashes are broken up by stirring, and a portion of the malt is added. This is termed "breaking up." The addition of the malt instantly changes the tough pasty mass into a thin mixture. This is stirred well, capped with the remainder of the rye meal, and let stand one or two hours, when it should be brought to a temperature of 150° F. or less, by adding one or two bucketfuls of cold water. Add all the malt. Stir well. It is now ready for the yeast made 48 hours previously. Again stir the mixture well for some minutes—all of the yeast being distributed between the three tubs except about two gallons, which should be left in the yeast barrel. Into this barrel pour about four gallons of the mixture from each tub, Nos. 1, 2 and 3. This is known as "yeasting back," and is done to prepare yeast for the next day's work. The tubs No. 1, No. 2, and No. 3, are now filled to within three inches of the top with cold or hot water, as required by the season, until the temperature of each tub when filled stands at 75° to 85° F. in warm weather, or from 95° to 100° in cold weather. The filling up of the tubs is styled "cooling off," and the "beer" is now said to be "set," and fermentation rapidly begins. The wort by the saccharometer should read 6° to 8° at this stage, and at the expiration of 96 hours should be attenuated to 0°, and is ready for the still. The tubs are covered over loosely with straw mats in cold weather, and in warm weather are left uncovered. The duration of the fermenting period varies with the season, being longer in cold, and proceeding so actively in very warm seasons as to render the process hard to control—the beer souring, lactic acid, acetic acid and aldehyd being formed; therefore, June, July and August are not favorite months for operating this class of distilleries.

"Mashing in," "breaking up," "yeasting back," and "cooling off," are carried on for tubs No. 4, 5, and 6, on the 2d day—and for tubs No. 7, 8, and 9, on the 3d day—and for tubs 10, 11, and 12, on the 4th day. And after the water for mashing in has been heated and used for 10, 11, and 12 on the 4th day, the contents of No. 1, 2, and 3 are conveyed to the still, by buckets, or by gutters and pumps. It is very necessary at this stage of operations to carefully and constantly stir the beer, until it is at the boiling point, otherwise the meal would settle upon the copper bottom, and quickly scorch, which would ruin a fine whisky—the scorching, when it does happen, can only occur in this part of the process.

The distillate resulting from this charge is called "low wines" and about 75 gallons are obtained from the beer contained in tubs No. 1, 2, and 3. A hydrometer is used to show when the charge is exhausted. The "spent beer" remaining in the singler still is then discharged into the "stop trough," or vat. The 5th day, "mashing in" differs from the process given above as follows. Tubs No. 1, 2, and 3 having been emptied the preceding day, are treated in the manner described for "mashing in," except that now "spent beer," or the supernatant liquor from the residue turned out of the discharge-spout of singler, after distilling over the "low wines," is used in cooling off, usually six or eight buckets of 2½ gallons each, to each tub. The "yeasting back" must be continued daily. The contents of the first four series of tubs (numbering twelve tubs) after distillation, will furnish, properly speaking, a "sweet mash" whisky.

That resulting from the process where "spent beer" furnishes the ferment is known as "Sour Mash." The process of mashing and fermenting now goes on in one unvarying routine (Sundays excepted), as described on the fifth day, and until operations are suspended at the will of the distiller. The low wines are daily pumped into the doubler still; and after the connections are closed with a luting of rye meal and water, made into paste, the fire is started, and the spirit is distilled off until it falls to 90° at the worm, at a temperature of 60° F., equivalent to 45 per cent. by volume of alcoholic strength. The distillate in the receiver or "cistern" will vary in quantity and quality, according to the care with which the process has been conducted, the condition of the grain used, and the state of the weather affecting the yeast and fermentation of the beer. About 2 gallons is the minimum, and 3½ gallons the maximum quantity of spirits of 100° proof at 60° F. usually obtained from each bushel of grain of 56 lbs. avd.

In large distilleries, having facilities for kiln-drying their grain, 4 gallons, and more, to the bushel is obtained, and 16,000 gallons per day. Mash tubs, beer wells and fermenting tubs or vats, are also used in the large distilleries. Limestone or marl water is best for keeping the yeast in condition. The action of sulphuric acid upon the starch of the grain during the mashing process increases the yield of spirit; but the "swill," being a valuable feed for stock, would be rendered unfit for stock-feeding unless freed from the acid remaining.

Until some change in the present Internal Revenue law affecting the manufacture of spirits is effected, there is but little encouragement for distillers of pure whiskies, brandies, rums and gins to compete with the cheaper class of spurious liquors placed upon the market by the "Rectifiers," formerly designated under the law as "Mixers and Compounders," which name was too expressive for profit, and was accordingly changed. The expression "straight goods," used in the trade, may mean the poorest corn whisky made by the "continuous process," or the finest "Bourbon," as the Government requires the same kind of stamps to be used for all classes of goods made at distilleries, viz: the "Distillery Warehouse Stamp" add "Taxes paid" stamp. The other two stamps are used on "single stamped goods," and are known as "Rectifiers'" stamp and "Wholesale Liquor Dealers'" stamp.

When a barrel is filled at a distillery, the Government Storekeeper and Gauger at once gauges and stamps it with the "Distillery Warehouse" stamp, showing the date of its manufacture; it is then placed in the bonded warehouse, where it can remain three years, unless, the tax of 90 cents per gallon, being paid, it is sooner removed, when a tax-paid stamp is affixed, stating the number of gallons upon which the tax has been paid, and the date of payment; and it is then ready for market.

The law requires that any change made by mixing, diluting, or manipulating in any manner, shall be deemed rectification, and a "Rectifier's" stamp placed upon the barrel, instead of the two original stamps, which must be destroyed.

The wholesale liquor dealer's stamp is used to cover the transfer from an original stamped barrel to smaller packages, from five gallons up. The wholesale liquor dealer's stamp is never used on original packages. Therefore, when a barrel bears either a wholesale liquor dealer's stamp, or rectifier's stamp, it is *prima facie* evidence of being mixed or rectified goods; and when a barrel bears both the distillery warehouse, and tax-paid stamps, it may generally be regarded straight goods, though some dealers draw out a portion from the contents of an original package, and refill with spirits.

ON CITRATE OF CAFFEINE.*

BY C. GILBERT WHEELER, CHICAGO.

Is the citrate of caffeine in the American drug trade a mixture?

The literature of chemistry abounds in contradictory statements relative to the existence of several of the salts of caffeine. This is specially true with regard to the compounds of organic acids with this alkaloid. A number are claimed to exist by certain chemists which by others are asserted to be mixtures merely. Moreover, those holding the latter view number among them some who discern, as they believe, in the chemical character of caffeine, satisfactory reasons for declaring *a priori* that compounds with most organic acids are impossible. Thus Tanret, in the Phar. Jour. and Trans. of last year, affirms, to quote his own language: "To sum up, then, organic acids do *not* form definite salts with caffeine." So sweeping a declaration as this, if not reiterated by other chemists, is at best *substantially* affirmed by many.

Indeed, caffeine is somewhat exceptional in its chemism. Its alkaloidal or basic character is exceedingly weak. It is neutral in its behavior toward litmus and most of the ordinary reagents, for alkaloids afford no precipitate with it, unless its solutions are comparatively very concentrated. In the cases of those mineral acids with which it forms salts, these latter are much less stable than those of most of the other alkaloids. Not being alkaline, it does not, in a correct sense, saturate these acids, but the acid properties, so to speak, shine through the translucent saline character of the compound.

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* Read at the Sixth Session.

The ease with which most of the salts of caffeine are decomposed by water at ordinary temperatures, is also a peculiarity of this alkaloid.

Now turning our attention to the specific compound of *citric acid* with caffeine, we find the number of those who admit the existence of such a body to be small compared with those denying it. The majority of the compendiums of chemistry ignore it altogether. Such eminent authority as Wittstein and Hager claim that in Europe, at least, especially in Germany, the alleged citrate of caffeine in trade is either simply the alkaloid alone, or the same with a small amount of citric acid mechanically mixed therewith, or adhering to the surface of the crystals.

Hager, in the supplement to his commentary, devotes considerable space to denouncing, in his vigorous manner, the placing in trade of the misnamed mixture.

Tanret, in the English journal I have previously quoted, says: "The product, which is decorated with this name, is only a mixture of caffeine and acid."

Mr. Hurty, in a paper before the Indiana Pharmaceutical Association, makes the same statement; and Prof. E. Schmidt, of Halle University, who, in the Berichte der Deutschen Chemischen Gesellschaft for 1881, publishing valuable researches on caffeine, says: "As regards citrate of caffeine, offered in the price lists of several chemical manufacturers, the author has found that no such compound can be formed."

Nevertheless, in spite of all that has been put forth with regard to the non-existence of that salt, it has been reserved for a distinguished member of this Association, Prof. J. U. Lloydd, to demonstrate that citrate of caffeine does really exist. He has thereby also given another illustration of how faulty is that chemical logic which concludes that because two bodies, when dissolved in the same solvent, do not, as a result of mixing the two solutions, yield a new compound on evaporation, that, therefore, this desired combination cannot be effected.

Prof. L. finds that, on dissolving the caffeine in chloroform, and the citric acid in alcohol, these solutions, on mixing and evaporating, yield a true salt of caffeine.

However, so far as I have been able to learn, this salt has not yet become an article of commerce.

I come now to speak of the results of my investigation of the American frauds of this supposed salt, as found in trade. And here my story need not be long, as the number of manufacturers who send out this compound is but small. It appears that three, or at most four American houses, supply the principal part of the demand.

It is claimed on the other side of the water that much of this preparation, purporting to be of American manufacture, is made in Germany.

In conducting my examination, I thought best to at once proceed to quantitative analysis; in each case determining the percentage of citric acid and caffeine. I might have made application of various tentative empirical methods that perhaps would have caused less labor (as for instance the action of solvents of widely different dissolving power for the respective bodies), but these methods I regarded as less reliable than the one employed.

Citric acid, whose formula is $C_6H_8O_7$, and crystallizing with one molecule of water, is a tribasic acid. Hence, three citrates of caffeine are conceivable; one with three molecules of caffeine, one with two, and another with one molecule, in each case replacing a corresponding number of atoms of basic hydrogen in the acid.

These three supposed citrates should contain, respectively, the following percentages of caffeine and citric acid:

	I.	II.	III.
Caffeine	71.6 %.	67.1 %.	50.3 %.
Citric acid	28.4	32.9	49.7

In the brand of this article having the most general sale in this country, I obtained 63.5 % caffeine, thus too much for the formula having one molecule in its construction, and too little for the one having two molecules. The same statement applies to the citric acid, which was found to be 36.5 %.

In the other two varieties examined, I found in one 81.1 % of caffeine and 18.9 % of citric acid; in the other, I found 96.53 % caffeine, and only 3.47 % citric acid.

These two latter samples are, therefore, essentially caffeine with slight admixture of citric acid. The amount of the latter is far below the amount which should be in the salt in which there is the smallest proportion of this acid, i. e. 28.4 %.

These three varieties are the principal ones in the market, in fact the only ones I have been able, after considerable effort, to obtain.

A microscopic examination of the second and third showed the characteristic crystallization of caffeine, very long, delicate acidular prisms, and scarcely any of the short, plump, much modified crystalline forms of citric acid. In the first variety the two kinds of crystals were more nearly equally abundant. An examination with polarized light did not prove to be of value in the recognition of the different crystallization, as was hoped it would. This examination on the whole shows that our supposed citrate of caffeine is a mixture.

COMMERCIAL CINCHONIDINE SULPHATE.*

BY GEO. W. KENNEDY.

Query No. 4.

"It has been said that sulphate of cinchonidine containing a considerable proportion of magnesium sulphate, has been found on the market. Is this true as regards the salt made by any of our American manufacturers?"

The acceptor of this query would report that he examined four specimens of American sulphate of cinchonidine, representing the same number of manufacturers, namely: Rosengarten & Son, of Philadelphia; Keasbey & Mattison, of Philadelphia; Powers & Weightman, of Philadelphia; McKesson & Robbins, New York.

The examination was made from samples obtained from the original packages, which were opened by the writer, each package bearing the manufacturer's name and place of business, and the mouth of each bottle being covered with a metallic cap, containing the initials or names of the maker, so that there could be no doubt as to each being genuine.

Several tests were used in order to be better able to determine the absence or presence of the supposed adulterant. The salt is soluble one part in 100 parts of water at 60° F. I took of each sample 10 grains, and dissolved it in 1000 grains of water. All the specimens were found soluble in this quantity of water. To each aqueous solution of the salt I added chloride of ammonium and carbonate of ammonium. The magnesium sulphate, if any be present, would remain in solution. The precipitated cinchonidine was collected on a filter and to the filtered liquid was added phosphate of sodium, which in the presence of sulphate of magnesium would precipitate phosphate of magnesium and ammonium as a crystalline powder. Ample time was given for precipitation after the solutions were mixed. In all cases no deposit was formed, thus indicating the absence of magnesium sulphate.

The second test resorted to, was incineration. This was accomplished by placing a known quantity of each of the specimens on platinum foil, and heating over a gas flame until ignition was complete. Upon examination, I found the salt had dissipated, but had left a carbonaceous substance (charcoal) behind, amounting to approximately 8 or 10 per cent.; this black substance was moistened with nitric acid and heated; this treatment was repeated a number of times, using only a drop of the acid each time, until the charcoal was consumed, when the whole of the substance had disappeared, again proving that the four specimens under examination contained no magnesium sulphate.

The third test was as follows: Sulphate of magnesium being soluble to the extent of $\frac{8}{10}$ its weight of water, and the sulphate of cinchonidine one in 100 parts, advantage was taken of this difference in their solubility. A drachm of each sample was treated with a small quantity of water, the liquid portion filtered and evaporated. The crystals resembled those of cinchonidine; they were redissolved in water, the solution mixed with solution of chloride of ammonium, and with ammonia water in slight excess, the precipitated cinchonidine was separated by filtration, and the clear filtrate mixed with a solution of phosphate of sodium. After permitting the liquid to stand for some time, and no precipitation having taken place, the absence of magnesium sulphate was again shown. These results prove satisfactorily and conclusively that the four specimens under examination did not contain magnesium salt.

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* Read at the Fifth Session.

COMMERCIAL QUININE PILLS.*

BY VIRGIL COBLENTZ, SPRINGFIELD, O.

"Examine the sugar- and gelatine-covered pills of the market, and report on their quality as regards purity and proportion of quinine."

The question of the full weight and purity of the sul. quinine pills of the present market has been the subject of a number of papers and arguments pro and con during the past year, bringing forth a number of conflicting statements and results. The general interest taken in the question of the full weight of quinine pills exhibits the increase of attention as to the standards of strength and purity of medicines. In the supplying and consumption of medicines and like products there is not only an imperative demand for accuracy and faithfulness, but a want for more definite limits of the variations of strength and purity.

To condemn the integrity of various manufacturing firms by the results of uncertain or inaccurate work, is a subject worthy of serious consideration on our part. Of course, inaccuracies or shortage in the weight of pills, on the part of manufacturers, besides being intentional, might occur through inaccurate calculations, or through carelessness and wastage in process employed in making the pills, or through the dishonesty of employés. These facts must be taken into consideration, so that we might not be too hasty in our decision. As a fact, it is a drug that can easily be employed to a material advantage by those who should be disposed to use it *as* such. The shortage of even $\frac{1}{5}$ grain in every 2 grain pill, or in other words, 11 per cent. in weight, in case of an extensive manufacturer, would, in the course of a year, amount to the saving of a few thousands. Nevertheless, *be* it as it may, a temptation or not, our attempt at the assay must be as strict and disinterested as is possible to conduct.

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* Read at the Fourth Session.

One of the first considerations brought to the mind in making our calculations is, how much water of hydration does the alkaloid in the commercial pills contain? Ordinary exposure to the air, such as leaving the stopper out of the jar while dispensing, causes the crystals to effloresce; and, after continued exposure, leaving only from 4.5 to 5 per cent. of water; of course, a longer or shorter period of time of exposure leaving more or less water of crystallization. "Thus," Prof. Prescott finds "on an average the alkaloid fresh from the can composed of 84 to 91 per cent. of anhydrous salt, an increase of 7 to 8 per cent. in concentration. In dispensing bottles, 84 to 95 per cent. anhydrous salt, an increase of 12 per cent. in degree of concentration." How much water of crystallization shall we accept of in buying, selling and administering sulphate quinine? The strongest authorities state that the pure crystals contain only 7 molecules, or 14.45 per cent., of water of crystallization; then the addition of water, which is found in many brands of the market, some of which contain as much as 16 per cent., must be held by adhesion. The Ph. Br. allows the loss of 15 per cent. of water in drying at 212° F.; the U. S. P., '80, places it at 7 molecules, or 14.45 per cent., but allows the presence of 16.18 per cent.; this latter figure I have adopted as the average amount found in the commercial salt. In order to determine the accuracy of our methods, a control assay would be necessary, since, if a process followed yield any above or below the quantity taken for assay, the process wants alteration. If no process is found to give accurate results, and after many trials it is found that a percentage of gain or loss can be established, then our work can be so calculated—*then*, and *then* only, can we proceed with any degree of accuracy. In order to try our method, a sample of 1 grain of Powers & Weightman sulphate quinine was taken from an unbroken package; first its water of crystallization estimated with all due precautions, to prevent loss of material, the temperature being as high as could be borne without decomposition, cooled as rapidly as possible, and quickly weighed. The water of crystallization amounted to 16.18 per cent. Another grain sample from same package was weighed out, and the amount of sul. quinine and foreign alkaloids determined by De Vrij's herapathite method, using the iodosulphate of chinoidin as the reagent. The amount of herapathite yielded was 2.245 grams, corresponding to .9360 grams crystallized sul. quinine containing 8 molecules, or 16.18 per cent. water of crystallization, indicating the presence of 6.39 per cent. of foreign alkaloids. This is done to test the accuracy of the following processes by comparison with a standard. Another grain sample of the alkaloid taken from the same package was mixed with glucose, starch, and other like excipients, including tolu balsam and resins, such as would be liable to be found in the commercial pill. In order to avoid loss, the mixing and drying was done in the same capsule, and treated according to the following processes, a different sample being prepared each time with all due precautions fore-mentioned.

The first plan tried was the lime process, which has since been recommended by another writer (Prof. Parsons), viz.: A number of pills, representing 20 grains of sul. quinine were mixed in a mortar with 5 cc. of water and about 2 or 3 grams of freshly slacked lime; when the pills became sufficiently soft, they were triturated to a smooth paste, and the mixture (while in the mortar) slowly dried on a water-bath. In most pills tried by this process, the mass became brown, due to the decomposition products, formed between the glucose and lime. The dry powder was then transferred to a flask with an accurately filted glass stopper, adding a quantity of ether fort., and allowing to macerate 12 hours; by means of a pipette the liquid was transferred to a tarred capsule, the residue again treated in a like manner, until a drop of the etherial solution evaporated on a watch-glass, moistened with dilute H_2SO_4, gave no reaction with Ulayer's test. The mixed etherial solutions were carefully evaporated in a platinum capsule, then heated some hours to 180° F., and finally increasing to 230°, until it ceased to lose weight. Chloroform was also tried instead of ether, but it exerted a solvent action on the decomposition products, giving inaccurate results. The ether, when used, gave accurate and corresponding results, as long as the tolu balsam or other resins were left out of my mass. A number of the commercial pills when examined by this process showed the presence of resins and other products soluble in ether. Other modifications were tried without success, it being comparatively easy to separate the alkaloid when alone, but the difficulty arose when we had resinous and like substances to separate from the alkaloid. The most reliable method found for the separation of the entire alkaloid in the state of purity, which also allowed, first, the removal of the resins and such like impurities, was as follows:

A quantity of sul. quinine pills representing 20 grains, is dissolved in about 10 cc. of distilled water acidulated with 3 cc. of dilute sulphuric acid (U. S. P.), in an accurately-fitting glass-stoppered bottle, of about 100 cc. capacity, warming slightly, if necessary, till solution takes place. In the solution (which is milky where the sugar-coated pill is examined), dissolve about 5 decigrams of the finest French gelatin, which when dissolved, and cold, should be sufficient to retain its position in the bottle when inverted. In the gelatin-coated pill, a lesser quantity of gelatin should be used. Warm the jelly slightly, until *uniformly liquefied*, add 30 cc. of ether fort., shake thoroughly for several minutes, taking the precaution to have the stopper tightly inserted, in order to prevent the escape of ether; set aside in a cool place till the jelly becomes firm. Pour off the etherial liquid, shaking the jelly to disengage any ether that might be imprisoned; evaporate a portion on a watch glass, if any residue is left, liquefy and add more ether, and continue till washings leave no trace of residue. This removes resin. Should the ether leave no residue, proceed at once as follows. Liquefy the jelly, add 50 cc. of ether fort. shake, add about 2 cc. of aqua ammonia (containing 30 % NH_3), or until in slight excess, to change the sulphate to neutral alkaloid. The whole contents of the bottle, containing the pills in solution and the ether, were vigorously shaken for a considerable time, the object being to bring the ether in contact with each minute particle of the alkaloid. Set aside in a cool place till the jelly becomes firm (better in ice), then withdraw the supernatant ether carefully in portions with a pipette, or pour off from the jelly into a tared capsule. Continue to liquefy and wash this gelatinous liquor, until a few drops of the etherial solution, when evaporated on a watch-glass, moistened with acidulated water, the acidity of the mixture determined by litmus paper, and a drop or two of Mayer's solution added, ceased to give the reaction. This test should not be used until after the third washing, in which 30 cc. of ether is sufficient. The capsule containing the ether and alkaloid, was placed on water-bath, then ether vapor was carefully blown out, and the evaporation quickly completed to dryness. Dry the residue at about 90° to 100° C. for several hours, then increasing to 110° C., until it ceases to lose weight. The weight of the flask with contents, less the weight of the flask, equals the weight of total ether soluble alkaloids. The weight of alkaloids (in milligrams) multiplied by 23.734 gives the quantity of crystallized sul. quinine (8 H_2O), in the 20 pills, expressed in grains.

Note 1. The jelly, in order to liquefy, should require but *very little* heat, and should be almost cool and *entirely* fluid, when shaken with the ether.

2. Care must be taken not to allow any particles of the gelatine solution, which might separate, to be transferred to the capsule.

3. The quinine residue should be perfectly *white;* should it have a brown color, the experiment must be tried over again, showing that sufficient care was not taken in transferring the ether from the jelly, or that the liquor was not washed sufficiently with ether before precipitation.

A point to be observed in favor of this method above given, that in conducting an analysis of this nature, the less handling, transferring, and filtering of the alkaloidal solution, there is to be done in the process, the greater is the degree of accuracy, and the less the liability to loss or error.

The qualitative estimation was made by De Vrij's method of estimating the amount of quinine as herapathite. The alkaloid, obtained by the evaporation of ether in the extraction of the quinine, having been carefully transferred to a tared flask, is dissolved in 20 parts by weight of alcohol (sp.gr. 820), containing 1.16% of H_2SO_4 and 20 parts of pure alcohol, the whole making 41 times the weight of the alkaloid. This solution is brought to the boiling point, and De Vrij's solution of iodo-sulphate of chinoidin added in slight excess, and again heated to boiling. The flask is then loosely corked and agitated frequently while cooling, to leave as few crystals as possible adhering to the glass. After standing two hours, the flask and contents are weighed, the contents transferred to a tared filter, and flask and filter well washed with saturated solution of herapathite in alcohol (sp.gr. 820). The filter is then gently, and afterward firmly pressed between folds of filtering paper, all the mixture possible being taken out in that way, then weighed and dried at about 212° F. until it ceases to lose weight. This gives the quantity of crystallized herapathite. The amount *in solution* is obtained by subtracting the weight of the herapathite, plus the moisture in the pressed filter, from the original total weight, and multiplying the result by .00133. The total herapathite multiplied by .551 gives the amount of alkaloid quinine ($C_{20}H_{21}N_2O_2$); multiplied by .7568, gives amount of sulphate containing $8H_2O$. For Prof. De Vrij's method, see Pharmaceutical Journal (1), vol. xi., p. 448.

In judging the quality of our commercial sul. quinine pills, we must judge them by the condition of our standard commercial brands of the alkaloid, as supplied in our markets. To expect a better quality or purer alkaloid in our quinine pills than we can obtain of itself in the market, would be absurd. It would be out of the question to expect a chemically pure salt for supplying our practical wants, but when we *do* want sul. quinine in the pill form, when supplied by a manufacturer, we *should expect* and *should be* supplied with it as pills, in as pure a state as the market affords the alkaloid itself. For example, the sample of P. & W. sul. quinine examined, contained 6.39 % of foreign alkaloids: although it is generally less than this, still this brand of quinine is considered to be among the best and purest in our market, and *is* pure enough for all practical purposes; and any sul. quinine pill which indicates by assay, the presence of foreign alkaloids, not exceeding this per cent., should be considered as pure as the market is capable of supplying, and should be free from censure. On examining the accompanying table, it will be seen that only four out of the eighteen samples, which fairly represent our market, would be rejected from deficiency of quinine. The four makers of these pills, though not widely known, have *always had* a very unsatisfactory reputation as to their integrity; hence any druggist with ordinary care can readily obtain quinine pills of full weight and reasonable purity.

The pills examined were obtained in their original packages, through wholesale houses, unknown to their makers. They were then placed by a disinterested party in other packages, and numbered. Each assay was performed twice, and quite a number of them several times. In about five samples there were considerable quantities of resinous substances, which caused a great deal of extra work: the remaining samples were comparatively free from this.

NUMBER OF SAMPLES.	Average Weight of Pills	Total Alkaloid in Number of Pills.		Total Calculated as Sulphate Quinine (8Aq).		Theoretical Quantity of Sul. Quinine in each Pill.	Total Herapathite from 1 Gram of Alkaloid. . .	Quantity Sul. Quin. Cryst. (8Aq) Calculated from Herapathite.			Per Cent. Other or Foreign Alkaloids, Calculated on Basis of Quinine . . . . . .
				All.	Each.			In All.		Each.	
	Grains.	Grams.	No. of Pills.	Grains.		Grains	Grams.	Grains.			
No. 1—Compressed	1 gr.—1.2 gr.	.850	20	20.173	1.008	1 grain.	2.371	19.931	20	.965	1.2%
	2 gr.—2.1 gr.	.875	10	20.767	2.076	2 "		20.518	20	2.051	
	3 gr.—3.3 gr.	.910	7	21.597	3.085	3 "		21.338	21	3.048	
	5 gr.—5.5 gr.	.853	4	20.245	5.061	5 "		20.003	20	5.000	
No. 2—Sugar Coated	1 gr.—3.1 gr.	.851	20	20.196	1.009	1 grain.	2.353	19.913	20	.995	1.9%
	2 gr.—3.8 gr.	.908	10	21.548	2.154	2 "		21.139	20	2.113	
	3 gr.—6.7 gr.	.910	7	21.597	3.185	3 "		21.181	21	3.026	
No. 3—Sugar Coated	1 gr.—3.1 gr.	.805	20	19.105	.955	1 grain.	2.325	18.513	20	.925	3.1
	2 gr.—5.1 gr.	.875	10	20.767	2.076	2 "		20.124	20	2.012	
	3 gr.—7.5 gr.	.925	7	21.953	3.136	3 "		21.273	21	3.039	
No. 4—Sugar Coated	1 gr.—3.0 gr.	.885	20	21.001	1.050	1 grain.	2.331	20.413	20	1.020	2.8
	2 gr.—5.1 gr.	.886	10	21.028	2.102	2 "		20.440	20	2.044	
	3 gr.—5.2 gr.	.925	7	21.953	3.136	3 "		21.339	21	3.048	
No. 5—Sugar Coated	1 gr.—3.4 gr.	.910	20	21.597	1.079	1 grain.	2.288	20.172	20	1.086	4.6
	2 gr.—4.4 gr.	.906	10	21.503	2.150	2 "		20.514	20	2.051	
	3 gr.—6.1 gr.	.927	7	22.001	3.143	3 "		20.989	21	2.998	
No. 6—Sugar Coated	1 gr.—3.1 gr.	.850	20	20.173	1.008	1 grain.	2.238	19.487	20	.974	3.4
	2 gr.—3.8 gr.	.875	10	20.767	2.076	2 "		20.061	20	2.006	
	3 gr.—5.4 gr.	.908	7	21.548	3.078	3 "		20.816	21	2.973	
No. 7—Sugar Coated	1 gr.—3.1 gr.	.765	20	18.156	.9078	1 grain.	2.112	16.032	20	.801	11.7
	2 gr.—5. gr.	.790	10	18.749	1.874	2 "		16.556	20	1.655	
	3 gr.—5.6 gr.	.810	7	19.225	2.747	3 "		16.976	21	2.422	
No. 8—Sugar Coated	1 gr.—2.6 gr.	.865	20	20.530	1.026	1 grain.	2.329	19.935	20	.996	2.9
	2 gr.—5.0 gr.	.872	10	20.696	2.069	2 "		20.096	20	2.009	
	3 gr.—7.1 gr.	.928	7	22.025	3.146	3 "		21.387	21	3.055	
No. 9—Sugar Coated	1 gr.—2.9 gr.	.868	20	20.601	1.030	1 grain.	2.348	20.172	20	1.008	2.1
	2 gr.—4.8 gr.	.883	10	20.957	2.095	2 "		20.517	20	2.051	
	3 gr.—6.4 gr.	.908	7	21.550	3.080	3 "		21.098	21	3.014	
	5 gr.—8.0 gr.	.862	4	20.458	5.114	5 "		20.029	20	5.007	
No. 10—Gelatin Coated.	1 gr.—2.0 gr.	.825	20	19.817	.990	1 grain.	2.322	19.183	20	.959	3.2
	2 gr.—3.0 gr.	.841	10	19.960	1.996	2 "		19.322	20	1.932	
	3 gr.—4.7 gr.	.886	7	21.028	3.004	3 "		20.356	21	2.908	
	5 gr.—8.0 gr.	.843	4	20.007	5.002	5 "		19.367	20	3.842	

NUMBER OF SAMPLES.	Average Weight of Pills.	Total Alkaloid in Number of Pills.		Total Calculated as Sulphate Quinine (8Aq).		Theoretical Quantiy of Sul. Quinine in each Pill.	Total Herapathite from 1 Gram of Alkaloid.	Quantity of Sul. Quinine Cryst. (8Aq) from Herapathite.			Per Cent. Other or Foreign Alkaloids, Calculated on Basis of Quinine
				All.	Each.			In All.		Each.	
	Grains	Grams.	No. of Pills.	Grains.		Grains.	Gram.	Grains.			
No. 11—Gelatin Coated	1 gr.—1.8 gr.	.862	20	20.458	1.022	1 grain.	2.334	19.906	20	.995	2.7
	2 gr.—3.6 gr.	.866	10	20.553	2.055	2 "		19.999	20	1.099	
	3 gr.—4.8 gr.	.906	7	21.503	3.072	3 "		20.923	21	2.089	
	5 gr.—7.8 gr.	.858	4	20.364	5.091	5 "		19.815	20	4.954	
No. 12—Gelatin Coated	1 gr.—1.7 gr.	.864	20	20.500	1.025	1 grain.	2.319	19.830	20	.991	3.3
	2 gr.—3.0 gr.	.869	10	20.624	2.062	2 "		19.944	20	1.994	
	3 gr.—5.0 gr.	.927	7	22.001	3.143	3 "		21.275	21	3.030	
	5 gr.—6.4 gr.	.867	4	20.577	5.144	5 "		19.898	20	4.974	
No. 13—Gelatin Coated	1 gr.—1.6 gr.	.856	20	20.316	1.015	1 grain.	2.293	19.423	20	.971	4.4
	2 gr.—3.0 gr.	.871	10	20.672	2.067	2 "		19.763	20	1.976	
	3 gr.—4.0 gr.	.907	7	21.526	3.075	3 "		20.579	21	2.939	
	5 gr.—7.0 gr.	.850	4	20.173	5.043	5 "		19.286	20	4.821	
No. 14—Gelatin Coated	1 gr.—1.2 gr.	.868	20	20.601	1.030	1 grain.	2.276	19.551	20	.977	5.1
	2 gr.—3.4 gr.	.874	10	20.743	2.074	2 "		19.686	20	1.968	
	3 gr.—3.9 gr.	.921	7	21.859	3.122	3 "		20.745	21	2.963	
	5 gr.—5.1 gr.	.871	4	20.672	5.168	5 "		19.618	20	4.904	
No. 15—Sugar Coated	1 gr.—3.6 gr.	.521	20	12.365	.618	1 grain.	1.513	7.803	20	.300	36.9
	2 gr.—5.4 gr.	.805	10	18.105	1.810	2 "		11.425	20	1.142	
	3 gr.—6.8 gr.	.561	7	13.314	1.902	3 "		8.402	21	1.201	
No. 16—Sugar Coated	1 gr.—1.3 gr.	.641	20	15.213	.760	1 grain.	2.202	13.967	20	.698	8.2
	2 gr.—3.0 gr.	.745	10	17.681	1.768	2 "		16.232	20	1.623	
	3 gr.—5.0 gr.	.604	7	16.471	2.353	3 "		15.121	21	2.160	
No. 17	1 gr.—2.9 gr.	.795	20	18.868	.943	1 grain.	2.250	17.690	20	.884	6.2
	2 gr.—4.7 gr.	.901	10	21.384	2.138	2 "		20.050	20	2.005	
	3 gr.—7.1 gr.	.912	7	21.645	3.092	3 "		20.304	21	2.901	
No. 18	1 gr.—1.7 gr.	.915	20	21.716	1.085	1 grain.	1.652	.748	20	.374	31.1
	2 gr.—3.1 gr.	.918	10	21.787	2.178	2 "		1.501	20	1.501	
	3 gr.—4.6 gr.	.925	7	21.953	3.136	3 "		2.161	21	2.309	
	5 gr.—6.9 gr.	.923	4	21.906	5.476	5 "		3.773	20	3.043	
P and W	2 gr.—10 pills.	.883	10	20.957	2.005	2 grains.	2.245	19.620	20	1.962	6.39

ON STATHMETOMETRIC ANALYSIS.*

BY WM. W. BARTLET, BOSTON.

Is it not desirable to have a stathmetometric method (in which the standard solution is made up to a given weight), as well as a volumetric method (in which the standard solution is made up to a given volume), inserted into the Pharmacopœia, thus doing away with the absolute need of measuring apparatus, which is dependent upon temperature.

Among the many valuable additions which the Committee of Revision have engrafted into our excellent Pharmacopœia of 1880, is list a of reagents and volumetric solutions. In this they have wisely followed the example set by the German and British Pharmacopœias, they having already adopted them.

By the means of these reagents and volumetric solutions, the pharmacist is enabled to satisfy himself of the purity of very many of his chemicals and pharmaceutical preparations, and is not dependent upon any one manufacturer, but may buy them in the open market and test them for himself. This is a decided step in the right direction, for it places the responsibility just where it belongs, with the pharmacist, and makes him alone responsible where in former times it was his custom to fall back upon the manufacturer.

But it is one thing to make a pharmacopœia, and quite another to force its immediate adoption. This being the case, every operation should be made as simple as possible.

No doubt this was the aim of the Committee of Revision in introducing parts by weight to take the place of weights and measures. Another aim, no less important was uniformity. This was carried out almost absolutely in the body of the pharmacopœia; but when we come to the standard volumetric solutions, we find that the old way of weights and measures is still preserved. We find that volumetric analysis is still directed to be used, carrying with it all the inconveniences of adjusting temperature, expensive burettes, litre-flasks, pipettes, graduated cylindrical litre-jars, burette stands, etc.

The inconvenience as regards temperature is especially noticeable in making standard solutions, for any error made in preparing them will impair the accuracy of a large number of determinations. In climates where the temperature is uniform, this error on account of temperatures is constant, and a correction *might* be made accordingly. But in climates like New England, where the extremes of temperature prevail, and the changes are quite rapid (quite frequent by changing fifty degrees in a few hours), these changes cause us serious inconvenience, and are matters of grave importance. Especially is this noticeable where we are obliged to keep a liquid at a given temperature for a length of time, or are working in midsummer or midwinter.

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* Read at the Fifth Session.

By using the stathmetometric method, this correction of temperatures and expensive apparatus is done away with, and much valuable time and expense saved.

The stathmetometric method of analysis has grown (and quite naturally) out of the volumetric method, and is one step forward in the march of improvement. All the apparatus that is required is some light containing vessel, such as a six-ounce prescription bottle, a glass tube drawn out to a fine point at the end in order to get a drop (making a good dropping tube) a good balance and correct weights—all of which the Pharmacist keeps in stock. The glass tube is placed in the bottle, the point resting on the bottom, and is weighed with it, and a record of this weight is carefully kept and used when calculating an analysis; or a Schuster's or Sallerod's dropping glass may be used. These dropping glasses or flasks may be had at any of the dealers in chemical apparatus for twenty-five cents each. So the cost for apparatus is in any event small. The stathmetometric method is identical with the volumetric method; only instead of volume being used, weights are substituted, and the normal solutions are made up to a definite amount by *weight* and *not* by *volume.* Thus the standard solution of oxalic acid is made by taking oxalic acid in perfect, dry crystals, 63 grammes, distilled water sufficient quantity. Dissolve the oxalic acid in 750 grammes of distilled water, using gentle heat if necessary. Add enough distilled water to make the solution *weigh 1000 grammes.* By using ⅕ part of these proportions, an ordinary six-ounce prescription bottle may be used. All the other standard solutions can be made in the same way, substituting the proper chemical or chemicals for oxalic acid.

In using this method we follow the directions of the Pharmacopœia, only substituting grammes for cc. Thus on page 398, under Volumetric Solution of Oxalic Acid, read 63 grammes in *1000 grammes* instead of 63 grammes in litre. Again, on the same page, read 1 gramme is the equivalent of oxalic acid 0.063 grammes, ammonia absolute 0.017, and so on. Again, on page 399, read ammonium carbonate 2.616 grammes taken, *50 grammes required*, and so on, *whenever* cubic centimeters are mentioned use *grammes.* Hence, if we wished to acertain the amount of absolute potassa in a given sample of potassium hydrate, we would proceed in this way: Having first ascertained the exact weight of the bottle and dropping tube mentioned above, we would next place a convenient quantity of the standard solution of oxalic acid in the bottle, and weigh. We would then weigh out a given quantity of the potassa, make a solution of it in distilled water, add an indicator (as a solution of litmus or phenol phthalin), and drop in the solution just weighed (using the dropping tube) till exactly neutral. Then *weigh* the amount of standard solution left, and subtract this amount from the amount first taken, and the result will be the amount used.

I have found in practice, in making normal solutions, that I could make them in from fifteen to twenty-minutes by this method, but when I was obliged to take temperatures into account (as by the volumetric method) I was from two to three hours in preparing them.

In the case of oxalic acid, I find that it dissolves very slowly at 60° F , but by heating a bottle in a water-bath and shaking, I find that it dissolves quite quickly, and as we pay no heed to temperature it can be finished as soon as dissolved. This is not the case when made by the volumetric method, for if we use heat above 60° F. in order to hasten the solution, we must cool again to 60° F. before we can add the remainder of the distilled water, and we must keep this distilled water at 60° F., or it will affect the temperature of the whole.

It might be urged that where the pharmacist had a great many samples of the same substance to examine that did not require great accuracy, that the stathmetometric method would require more time, the standard solution being required to be weighed each time. This is quite true, but these conditions do not happen to the pharmacist. He cannot use *too great accuracy* in examining the purity of his drugs, and he rarely has more than one or two samples of the same drug to examine at a time ; and the time taken to arrange and set up his volumetric apparatus and arrange the temperatures would be far greater, and the results less accurate.

I am convinced that this method should by all means be introduced into the pharmacopœia at least in addition, if not wholly replacing the volumetric method.

STATHMETIC ESTIMATION.*

BY ALFRED B. TAYLOR, PHILADELPHIA.

Query 16.

Is it not desirable to have a stathmetometric as well as volumetric method inserted into the pharmacopœia, thus doing away with the absolute need of measuring apparatus which are dependent upon temperature?

Although volumetric solutions were introduced into the British Pharmacopœia in 1864, they have not been used to any considerable extent in the United States, and did not find a place in our National Pharmacopœia until the recent revision of 1880.

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* Read at the Fifth Session.

The subject of volumetric analysis has not received from pharmacists that consideration and attention which its importance deserves.

It is believed that few pharmacists know much about volumetric analysis, and it is to be regretted that a still smaller number put into practice what they do know. The opinion appears to prevail that the subject is very difficult and abstruse, and that it requires more time, attention and expense than can conveniently be spared either for its study or its practice.

Quantitative analysis, or the operation of ascertaining, separating, and accurately weighing the constituents of a compound, is frequently very complicated and tedious, occupying a long time, in many cases requiring elaborate apparatus, and in every case the exercise of much care and precision, as also a considerable amount of experimental knowledge.

Volumetric analysis, on the other hand, is easily and quickly performed; as a general rule is susceptible of extreme accuracy, and needs much simpler apparatus.

The name does not appear to be exactly a proper one, since the process is used not for the purpose of ascertaining the quantity of some ingredients already known. It should therefore be rather called "volumetric estimation," or "determination," or "volumetric testing."

The leading principle of the method consists in submitting the substance to be estimated to certain characteristic reactions, employing for such reactions solutions of known strength, and from the volume of solution required for the production of such reaction, determining the weight of the substance by the aid of the known laws of chemical proportions.

In a paper by the author, published in the *American Journal of Pharmacy* for July, 1880, the following suggestions were thrown out:

"Might not the process of volumetric analysis be much simplified; and especially in view of the abandonment of measures of capacity by the United States Pharmacopœia, would it not be more in accordance with the plan of the work if measures of capacity were abandoned here also? It is proposed then that all test solutions shall be made to weigh certain amounts, instead of being made to measure certain volumes. In using a test solution thus prepared, it is evident that every grain weight of it would combine with a certain specific amount of the substance to be tested; no further observation is necessary than to note how many grains of the test-solution have been used, and to obtain the answer to the problem is a simple matter of calculation. This plan would do away with all apparatus; the only instruments necessary to carry it out would be flasks or appropriate vessels in which to weigh the solutions, and an accurate set of scales and weights to weigh them. Variations in temperature would not affect the results; the process is more easy of application, and inasmuch as weighing can be done with more exactness than measuring, greater accuracy would be obtained. This plan would be equally satisfactory with any system of weights, whether the British system or the metric system, or simply parts by weight, were used."

Any pharmacist would be enabled to use the tests, and would be much more likely to use them, than if special apparatus had to be employed. It is believed that the results obtained would be equally satisfactory.

Many of the burettes and graduated vessels made for volumetric purposes, are incorrectly marked, and hence are worse than useless, because they mislead those who rely upon their accuracy; and it is feared that many pharmacists into whose hands they may come, have not the experience or skill to verify their instruments.

These suggestions were brought before the Committee of Revision of the Pharmacopœia, and upon a vote being taken, the following was the result: Four voted to introduce this process to the exclusion of the volumetric process; seven voted to introduce it alongside of the volumetric process, while twelve voted not to admit it; and it was therefore rejected.

Notwithstanding this decision, it is believed that time will show its availability and superiority, and that in the near future it will be admitted.

It has been objected to the scheme, that accurate scales and weights would be required; this is true, but these are already required to make the standard solutions used in the volumetric process, the solid ingredients of which must be carefully and accurately weighed.

The name Stathmetometric (derived from the Greek words "σταθμητος" —*weighed*, and "μετρικος" *pertaining to measure*), has been applied to this method of testing.

Although we speak of things being measured by weight, we generally use the terms "weights" and "measures" as meaning specific and distinct subjects, the word "measure" being usually restricted in its application to length or distance, and to size or capacity; for this reason the term "metric" as applied to determination by weight, is not entirely appropriate; besides which the term "metric" has a special significance, with which the scheme of testing has no necessary connection.

I have, therefore, suggested in place of "stathmetometric," the term "stathmetic," from the Greek word "σταθμετικος," *pertaining to weighing*, a word which is more easily uttered, and which is as completely significant as the longer word.

I would respectfully ask the members of this Association to give the Volumetric and Stathmetic processes a comparative trial, and report the results of their experience at the next annual meeting.

III. MATERIA MEDICA.

CAFFEINE IN COMMERCIAL POWDERED GUARANA.*

BY J. H. FEEMSTER, CINCINNATI.

Query 48.

"What is the proportion of Caffeine in the Powdered Guarana of Commerce."

That adulteration is commonly practised, not only in medicinal drugs, but also among articles of every-day consumption as food, has been abundantly proven by investigation made by those who are eminently fitted for such work.

With the results of these investigations in mind, I was prepared in accepting this query, to find that Guarana in the process of powdering, was contaminated with some inert substance foreign to the drug.

I have, after analyzing five samples (of five hundred grains each), procured from as many different sources, been most agreeably surprised to find the proportion of caffeine so large in each specimen, that the idea of adulteration is precluded.

The results as appended, were secured by the process of Prof. E. S. Wayne, as mentioned in my answer to query No. 30 "On Caffeine in the Guarana of Commerce." (Proceedings Am. Phar. Assn., 1882, page 569).

No. 1	yielded	21½	grains Caffeine,	or	4.3	per cent.
" 2	"	23	"	"	4.6	"
" 3	"	24½	"	"	4.9	"
" 4	"	24	"	"	4.8	"

No. 5 yielded 25 grains Caffeine, or 5 per cent. The total yield from the five specimens was one hundred and eighteen grains, (118) and the average, twenty-three and six-tenths (23.6) grains, or four and seventy-two hundreths (4.72) per cent.

The above percentages are greater than those resulting from the analyses made on the crude Guarana as reported last year, and I can only account for the difference by supposing that the drug was dried to some extent before powdering. Be this as it may, however, the results, as above reported, are sufficient to lead to the conclusion that the samples analyzed were not adulterated, and to encourage us to the belief that the reports that have been made during the several years past on adulterations, have been of some effect.

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* Read at the Sixth Session.

ON OIL OF BIRCH BARK AND OIL OF WINTERGREEN.*

BY GEO. W. KENNEDY.

Query No. 41.

"Is oil of birch bark sold in commerce under the name of oil of wintergreen?"

Before answering the query, I will furnish a little information on this subject, which, no doubt, will be of some interest to the profession.

It is well known that little has been done for almost forty years towards determining the true chemical composition of oil of birch. Procter, in 1844, found it to contain salicylic acid, and to be almost identical with the oil of gaultheria; and from that time up to 1882, nothing was done till the writer made some experiments which proved the presence of salicylic acid. I have two specimens here—one, the oil of birch, and the other, oil of gaultheria—which are known to be absolutely pure. You will observe whilst they both possess that strong and agreeable aromatic odor, and a sweetish aromatic taste, characteristic of both oils, yet by close comparison a difference can be perceived; this is another case where two oils obtained from different plants closely resemble each other. The same remarks apply to the oils obtained from Ceylon cinnamon and Chinese cinnamon, also the oils of *Pimpinella anisum* and *Illicum anisatum.* The sample of oil of birch was made last March; it was then colorless, but now has acquired a reddish color.

This year, Mr. H. P. Pettigrew, a student at the Philadelphia College of Pharmacy, made a thorough investigation of the oil, which can be found in the August number of the American Journal of Pharmacy, the results of which are briefly summarized as follows:

1st, The volatile oil of birch is not identical with the oil of gaultheria in that it consists entirely of salicylate of methyl, and contains no terpene.

2d. The specific gravity of oil of gaultheria is not 1.180, as stated in the United States Pharmacopœia, but 1.0318, the former being the sp. qr. of oil of birch, which as is known is often indiscriminately sold and employed as oil of gaultheria.

Mr. Pettigrew evidently made a very careful and creditable analysis of the oil, but failing to discover a terpene, Prof. Maisch induced the writer to investigate the process more carefully by which the oil of gaultheria is obtained, believing that the hydrocarbon was washed away during the manufacture of the oil. This supposition proves to be correct, as

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* Read at the Fourth Session.

I soon detected the mistake of the distillers, by which the terpene is lost, which I shall explain further on.

In my paper on oil of birch, published in the American Journal of Pharmacy, 1882, page 49, I gave a concise description of how the oil is extracted, a portion of which I here repeat: "The material being ready for distillation, is placed in the still, as much as this will hold, and a sufficient quantity of water is added to fill the still about one-third full. The still is generally permitted to remain in this condition over night, a fire is made in the morning, and distillation proceeds nicely. The condensers used are of two kinds, one being the ordinary copper worm placed in a large barrel, while the other is made of copper pipe, about 2 inches in diameter, and shaped like the letter **U**, each wing being 12½ feet long, and placed in a trough. A stream of cold water is constantly passing into the barrel and trough, which is carried several hundred feet by a wooden gutter, from a creek of clear spring water. The condensed steam in the condenser consists of water and oil. The **U**-shaped condenser, the distiller says, is more desirable than the other, because the first portion of distillate contains oil, whilst in the old worm style several bucketfuls of water pass out before a drop of oil makes its appearance. As the liquid comes from the condenser, a novel contrivance is used for collecting the oil and water, consisting of a Mason's fruit jar (large size) complete; a small tin funnel is placed in the metallic cap of the jar at one side, and extends below the cap; the condensed liquid runs through the funnel into the jar, and as the weight of the oil is greater than that of the water, it sinks to the bottom of the receiving vessel. The water runs out through a pipe fastened into the cap on the side opposite to that where the funnel is inserted, is conducted into a bucket, and finally emptied into a barrel, to be used again for the next lot of material. The same plan is carried out at nearly all the distilleries.

You will at once see the defect in the distillation. The distiller collects that portion which falls to the bottom of the vessel, which is no doubt exclusively salicylate of methyl (methyl salicylic ether), the light terpene separating and floating on the surface of the water in drops; this is known as "light oil," and "light ring." No care is taken to collect it, and it is nearly all washed away or lost. I communicated with a number of distillers on this subject, asking them if they had ever noticed a light substance on the top of the water, and the reply was always the same, that they had, and that they never took any pains to save it, not knowing it had any value. This would explain why Mr. Pettigrew failed to get any terpene. Judging from the quantity which separates, as explained to me, the oil may contain as much as the oil of gaultheria, about 10 per cent.

In this locality, the oil of gaultheria is made in a similar manner as the oil of birch, and I presume upon examination it will be found lacking in gaultherilene.

The sample spoken of by Mr. Pettigrew, in Mr. Maisch's possession, came from me, and I have every reason to believe it strictly pure—its low specific gravity would also indicate that it contains the hydrocarbon. The two samples on the table, you will observe, are of about the same specific gravity; oil of gaultheria is 1.181 at 84° F., the oil of birch 1.180 at the same temperature.

Old leaves of gaultheria do not yield as much oil as new leaves. Old leaves on plants that have never been picked yield approximately 12 oz. to 100 pounds of the leaves. Spring leaves, or leaves gathered in the spring, from plants that have been previously picked twice a year, in the spring and towards fall, yield about 14 ozs. to 100 pounds of the leaves. Again, the leaves gathered in September from first year's plants yield as much as a pound from 100 pounds of the leaves.

Returning to the query, I would answer, yes; the oils of birch and wintergreen are mixed, sold and used indiscriminately as oil of gaultheria. Enormous quantities are made in Schuylkill county, Pa., and the few adjoining counties; one would wonder for what purpose it is all consumed and where it all goes. In the counties of Carbon and Monroe there was not less than twenty tons made last year, and from present indications that quantity will be reached this year. The amount of oil of birch distilled is estimated at 40 per cent. Bradford, Sullivan and Susquehanna counties make about two tons annually, about 10 per cent. of which is oil of wintergreen. Schuylkill county makes about 1000 lbs., of which about 10 per cent. is oil of wintergreen. In the first two counties the leaf (teaberry) grows more abundantly; that accounts for the larger percentage of the oil.

[Note.—After the meeting, when the distillation of the oil of birch had been commenced, the writer had occasion to examine some of the "light oil" spoken of, and found it to be methyl salicylate adhering to chips of wood, and floating upon the condensed water; the oil was free from hydrocarbon.]

THE PRECIPITATE IN TINCTURE OF BOLETUS LARICIS.*

BY C. W. PHILLIPS.

"What is the nature of the precipitate found in Tincture of Boletus laricis?"

It is so much like the Boletus laricis itself, that to understand its nature we must first take into consideration the nature of Boletus laricis.

Boletus laricis, agaricus albus, polyporus officinalis, larch agaric, white agaric, purging agaric, is procured from Asia, Corinthia, Russia, Central America, Rocky Mountains, in fact, wherever the larch tree grows.

The climate may have some influence on its chemical composition. This is an interesting point, and we may have occasion to refer to it again, from the fact that so many ingredients have been discovered by different chemists, which may ultimately be shown to have originated from the same source.

It is collected in August and September (when the weather is usually warm), deprived of its outer covering, and dried and bleached in the sun.

Composition.—Boletus laricis contains agaric acid, boletic acid (fumaric acid), fungic acid (a mixture of citric and malic acids), oxalic acid (?), benzoic acid (?); a white substance, *insoluble* in chloroform and crystallizing in needles; an amorphous white body, *soluble* in chloroform, agarica resin, fungin—possibly mannit or mycose, magnesia and calcium salts.

Agaric Acid, $C_{16}H_{30}O_5$, H_2O, E. Jahns in A. J. P., Aug. 1883, supposed to be identical with the *agaric acid* of Fleury, $C_{16}H_{28}O_5$, and also with the *laricin*, $C_{11}H_{48}O_2$ of Martius & Will (this appears to be different from the laricin obtained from the Polyporus igniarius, which has a formula $C_{11}H_2O_1$, as given by American Disp., and also different from the resin which Hager calls laricin.—Pharm. Praxis. Vol. 1, p. 195), and the *agaricin* of Schoonbroodt obtained from the agaricus albus.

These four substances, which are supposed to be identical, are described as follows:

I. *Laricin*, $C_{14}H_{48}O_2$ (Martius & Will, 1846), is a white, amorphous, bitter powder, soluble in alcohol and oil of turpentine, and forming a jelly with hot water.—National Disp.

II. *Agaricin* of Schoonbroodt (1863) occurs in the agaricus albus, the inner substance of the larch agaric. (Polyporus offic.) It is to be distinguished from *Amanitin*, the poisonous principle of agaricus bulbosus, agaricus muscarius, and agaricus volvaceus, and from the non-saponifiable, buttery fat obtained from the edible mushroom (slightly soluble in cold and boiling alcohol, *easily soluble in ether*), which has also been called *agaricin*.

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*Read at the Sixth Session.

When agaricum albus is exhausted by percolation with cold water and 86% alcohol in succession, the alcoholic extract leaves, on evaporation in vacuo, an amorphous, yellow residue amounting to 65% of the agaric employed, and soluble to the extent of one-third in 50% alcohol. This solution is allowed to evaporate spontaneously, the white powder which is then deposited is dissoled in strong alcohol, and the solution is mixed with one-fourth volume of ether, which precipitates extractive matters. The ether-alcohol solution leaves an evaporation, *agaricin*, as a white, crystalline powder, made up of microscopic flat prisms; tastes at first insipid, afterwards sweetish, bitter and pungent; free from nitrogen. It does not reduce alkaline solutions of copper, either alone or when mixed with emulsin, and left for 12 hours at 40°, but it exerts a slight reducing action after being boiled with dilute sulphuric acid, and after an hour's contact with saliva, *a peculiar sugar* being apparently produced.

It is dissolved and decomposed by strong acids and alkalies, soluble to a slight extent in water and alcohol, but *not in ether*. *Gmelin's Chemistry*, vol xviii. p. 213.

Agaric acid $C_{16}H_{28}O_5$ (Fleury, 1870). G. Fleury obtained this acid by extracting the dried and pulverized boletus laricis with anhydrous ether. The substance crystallizing in bunches of needles, he called *agaric acid*. It melts at 145.7°, and at a higher temperature loses its water and chars; is scarcely soluble in water, but gives it a sour reaction; very soluble in alcohol, less soluble in chloroform, only slightly soluble in ether and acetic acid, still less soluble in bisulphide of carbon and benzol.

It volatilizes with the alcohol vapors when its alcohol solution is distilled.

Easily soluble in alkaline solutions.

Its soda salt is precipitated by alcohol in the form of amorphous flakes, which in the course of 24 hours concentrate into groups of needles. Most metallic salts give crystalline precipitates. *Hager Pharm. Prax., and Husemann, Pflanzenstoffe.*

Agaric acid, $C_{16}H_{30}O_5H_2O$ (E. Jahns, 1883). Agaricus albus is exhausted with hot 90 per cent. alcohol, the tincture concentrated to the weight of the drug and cooled, when *agaric acid* separates in indistinct crystals mixed with white resins, the red bitter resin remaining in solution. The precipitate was collected, mixed with ten times its weight of 60 per cent. alcohol, warmed in the water-bath until the crystals were dissolved and filtered while hot, the solution was evaporated, the residue repeatedly recrystallized from absolute alcohol to separate the resin, until it was perfectly soluble in water. A little lime and magnesia was removed by recrystallization in the presence of hydrochloric acid, and an amorphous body was separated by dissolving in hot 30 per cent. alcohol, and cooling to 50° C, when pure *agaric acid* crystallized in delicate silvery plates. It crystallizes from alcohol in groups of prisms, is inodorous and tasteless, melts at 138° to 139° C, requires at 15° C 126 parts of 90 per cent. alcoholfor solution, is readily soluble in warm alcohol, glacial acetic acid, oil of turpentine, less soluble in ether and nearly insoluble in cold water, chloroform and benzol.

In boiling water it swells to a jelly-like mass, and finally dissolves to a strongly acid, somewhat ropy liquid. Its composition is $C_{16}H_{30}O_5H_2O$, the water being partly given off over sulphuric acid, and entirely at 100° C.

It is a bibasic triatomic acid, and homologous with malic acid. Its neutral alkali salts are easily soluble in water, and precipitated by alcohol in an amorphous condition, the sodium salt hardening to a radiating crystalline mass; the other salts are amorphous. The acid salts are little soluble in water and with difficulty obtained pure. When boiled with nitric acid, agaric acid yields succinic acid and volatile fatty acids, among which butyric acid seems to predominate.—A. J. P., Aug. 1883.

Boletic Acid, fumaric acid (?). Whether boletic acid exists in boletus laricis or not, and whether the boletic acid of Braconnot is identical with fumaric acid, and whether fumaric acid is actually a component part of boletus laricis, does not seem to be very clear.

The boletic acid of Braconnot was prepared by precipitating the decoction of boletus pseudo-igniarius with alcohol, and the white sediment, after being dissolved in water, was precipitated by nitrate of lead, and the precipitate treated with sulphuretted hydrogen, whereby the *boletic acid* was set free.

It crystallizes in four-sided needles, tastes like cream of tartar, has a strongly acid reaction and is sublimed unchanged; soluble in 180 parts water at 20°, and in 45 parts alcohol; precipitates oxide of iron from its solutions. (Liebig organische Chemie, p. 432.) Hager says, "boletus laricis further contains fumaric acid, citric and malic acids, which formerly had been known as boletic and fungic acids."

The boletic acid of Bley (1834) according to Bolley and Dessaignes (1853) is identical with fumaric acid. Braconnot's fungic acid was ascertained by them to be a mixture of citric and malic acids.—Nat. Disp.

The Homeopathic Pharmacopœia classes boletic acid and fumaric acid as synonyms. (p. 75).

If fumaric acid does exist in boletus laricis, it brings it into relationship with other substances which contain fumaric acid, namely: Fumaria officinalis, Lichen islandicus, Glaucium luteum, and Corydalis bulbosa.

But since fumaric acid is also obtained by the dry distillation of malic acid, and malic acid exists in boletus laricis, may not the existence of fumaric acid be the result of some chemical action, which may take place in the preparation of the boletus?

Fumaric acid, $C_4H_4O_4$ is described as follows: The acid obtained from malic acid crystallizes in broad, striated colorless prisms, sometimes rhombic, sometimes hexagonal. (Pelouze.)

That obtained from fumitory crystallizes in scales, united in stellate groups. (Winckler). That from iceland moss in needles. (Pfaff). In crystals aggregated in cauliflower tufts. (Schödler.)

The acid sublimes in long white needles, (Lassaigne, Winckler) requires a high temperature to melt it, volatilizes somewhat above 200°, even before melting giving off vapors which attack the eyes strongly. (Winckler.) It sublimes for the most part unaltered, but partly resolved into water and fumaric anhydride. It is inodorous, tastes very acid, and reddens litmus strongly. (Winckler, Pelouze and others.) It burns with a pale-blue flame. (Winckler.) When triturated and heated with peroxide of lead, it gives off water, and then takes fire, without emitting any odor of formic acid. (Rieckher.)

The colorless solution of the acid in oil of vitriol turns brown when heated (Winckler), and gives off sulphurous acid (Rieckher).

The aqueous solution of the acid is not altered by eight days' boiling, or, when heated in a sealed glass tube to 250°, *not* being converted into malic acid. (R. Hagen.)

The acid is not decomposed by boiling nitric acid s. g. 1.4, but remains unaltered when evaporated (Winckler), and separates out on cooling with peculiar whiteness and brilliancy (Demarçay and Schödler). It is not decomposed by boiling with water and peroxide of lead, or bichromate of potash, and does not precipitate platinum black from bichloride of platinum (Rieckher). It dissolves in 390 parts of water at 10°, and a much smaller quantity of hot water (Winckler); in 210 parts water at 12° (Lassaigne); and in 216 parts water at 17° (Probst); dissolves readily in ether (Winckler and others), readily in 82% alcohol (Winckler), and in 21 parts of 76% alcohol (Probst). Fumaric acid expels acetic acid from the acetates. Many fumarates are solubte in water, but none in strong alcohol. Free fumaric acid, or solution of a fumarate, added to nitrate of silver solution, throws down a fine white powder (Lassaigne). The acid, dissolved in 200,000 parts of water, so completely precipitates a silver solution that the filtrate shows no turbidity with HCl (Pelouze). Fumaric acid combines directly with nascent hydrogen to form succinic acid.—Gmelin's Chemistry.

Citric acid, }
Malic acid. } Formerly called fungic acid (Nat. Disp. and Hager).

Oxalic acid (?). The presence of oxalic acid, in the form of hydropotassic oxalate or calcium oxalate, has been regarded by some chemists as a common constituent of fungi; has been demonstrated in about 30 species by the experiments of Hamlet and Plowright.—Watt's Dictionary, p. 832.

Benzoic acid (?).—Masing denies the existence of benzoic acid observed by Bouillon-Lagrange.—Nat. Disp.

A white substance, insoluble in chloroform, crystallizes in needles; fusible at 271° to 272° C. It forms part of Masing's white resin.—E. Jahns.

An amorphous white body, soluble in chloroform, separating from its solutions in the form of a jelly, and identical with Masing's white resin, soluble in chloroform.—E. Jahns.

Agarico-resins, $C_{61}H_{82}O_{10}$ (Fleury), is an intensely-bitter, reddish-brown resin, rubbing up to a whitish-yellow powder; melts at 89°; insoluble in water; easily soluble in strong alcohol; scarcely soluble in 50% alcohol; *very little in chloroform* (Hager); *easily soluble in chloroform* (Husemann and National Disp.); easily soluble in wood alcohol, acetic acid and ether (which becomes ropy); *insoluble* in benzol and bisulphide of carbon (Husemann); *soluble* in benzol and amylic alcohol (Nat. Disp.); easily soluble in alkaline solutions, which become dark-colored and foam on shaking (Hager). It is precipitated by most metallic solutions. The barium precipitate is $C_{61}H_{82}Ba_2O_{11}$ (Husemann). This red resin is supposed to be the cathartic principle, but Behr says he took 4 grams without it producing any purgative action.

Fungin, of which Braconnot found 26%, has been shown to be merely meta-cellulose, and may be obtained by treating agaric with water, weak soda solution, hydrochloric acid and alcohol. U. S. D.

Thus we see the nature of boletus laricis from various standpoints.

The tincture of boletus laricis, as furnished me by Prof. J. U. Lloyd, was prepared by percolation with alcohol, each pint of tincture representing one pound of the drug. The precipitate, as it forms in the tincture, has a semi-crystalline appearance, and settles to about one-fourth the height of the liquid in the bottle. More than nine-tenths of this precipitate is soluble in cold alcohol, and the filtered alcoholic solution of this precipitate has only slightly precipitated after standing eight months. (This precipitate, however, is not redissolved on shaking.) The residue from the alcoholic solution was then digested in ether, and the residue digested in water, and thoroughly washed and dried by spontaneous evaporation, and weighed. $3\frac{9}{10}$% of the precipitate found in tincture of boletus laricis is insoluble in alcohol, ether and water. The filtrates and this precipitate have not yet been examined.

It would appear from the above facts, that a tincture prepared with less of the drug would be more stable. Accordingly, a tincture was prepared by percolating one ounce of boletus laricis with alcohol, making four ounces of the tincture. The next morning quite a large quantity of precipitate made its appearance, but after several days a portion seemed to redissolve, and now the tincture does not contain more than about one-fifth as much precipitate as that of Prof. Lloyd, and is darker in color. (The homœopathic pharmacopœia directs 1 part of agaric to be macerated with 5 parts of diluted alcohol for two weeks, and filtered.)

A drop of Prof. Lloyd's tincture was placed on a glass slide, and observed under the microscope. As the alcohol evaporated, needle-shaped crystals made their appearance, as shown in figure 1, and almost instantly other crystals began to appear, as shown in figure 2, then the field assumed the appearance of figure 3, the crystallization being interfered with by the resinous matter, and the needle-shaped crystals being entirely covered by crystals which had the appearance of commercial citric acid, when spread out flat on the counter. When the plate was entirely dry, it assumed the appearance of figure 4, a number of star-shaped crystals making their appearance.

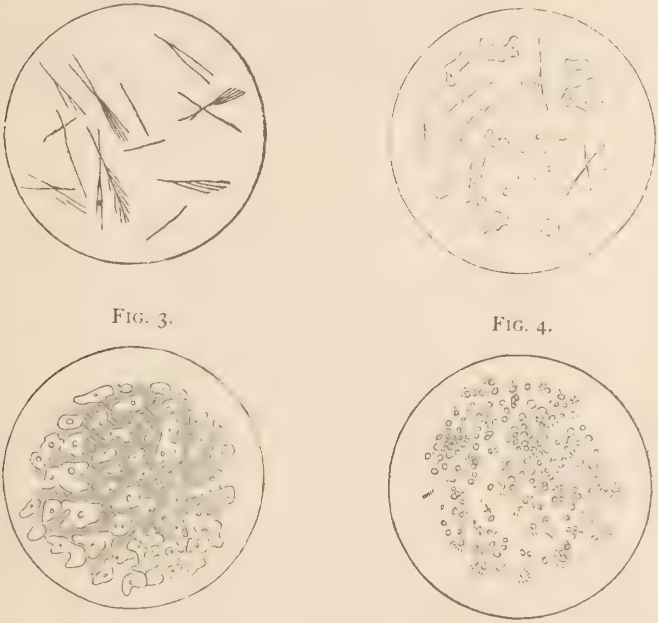

Fig. 1. Fig. 2. Fig. 3. Fig. 4.

Crystals from Tincture of Boletus laricis.

A drop of the alcoholic solution of the precipitate was treated in the same manner. A few needle-shaped crystals as shown in figure 1, made their appearance, not so many, however, as were seen in the tincture itself, and about the same quantity of the other crystals as shown in figures 2 and 3 were seen.

A drop of the etherial filtrate, spoken of above, was also examined. No needle-shaped crystals could be seen, but the field was covered with those same crystals, having the appearance of citric acid.

A small quantity of agaric acid was prepared after Jahns's method, and the hot alcoholic solution examined under the microscope; after some time three kinds of crystals made their appearance. The greater portion were needle-shaped, but one large crystal just looked like a lump of chlorate of potash, two or three smaller crystals had a rhombic shape, and were slightly tinged yellow, probably from some resin adhering to them. The other crystals were entirely colorless.

A portion of the precipitate was boiled with alcohol and the solution examined. No needle-shaped crystals could be seen. Owing to the great number of points to be investigated, I am unable at this time to give any fuller information, and therefore ask for further time.

MINUTES

OF THE

THIRTY-FIRST ANNUAL MEETING.

FIRST SESSION.—TUESDAY AFTERNOON, SEPTEMBER 11, 1883.

The American Pharmaceutical Association assembled at its thirty-first annual meeting, in the lecture room of the National Museum, on the grounds of the Smithsonian Institution, in the city of Washington, D. C. More than a quorum being present, President Heinitsh took the chair at 3 o'clock p. m., and called the meeting to order.

The Local Secretary, Chas. Becker, introduced to the meeting General J. West, as the representative of the municipality of the District of Columbia, and Mr. West spoke as follows:

GENTLEMEN: It having been customary on the occasion of your annual assemblages, to be welcomed by the Municipial Authorities at the localities where you meet, the Commissioners of the District of Columbia have deputed me to say to you a few words of greeting on behalf of the people of Washington City, on this the occasion of your thirty-first Annual Convention. A review of the programme of the exercises and deliberations that will command your attention during your sessions, admonishes me to be brief; especially as, could I say anything that would be kindred to the objects of your association, it could be, and will no doubt be better said by brethren of your order, and by the members and distinguished scientists who will address you. But I may be permitted to express our admiration of the efforts of the American Pharmaceutical Association to elevate the standard of your profession. The labors of its members, their research and analysis, co-operating with and aided by kindred societies in other lands, are completing the grand work of evolving from the myths of credulity and the terrors of superstition, a science whose benefits are for the greatest interests of humanity, caring for them with the skill and intelligence beyond the conception of most outside of the ranks of its devotees.

It is fitting here, too, in the capital of the nation, that the broad and catholic spirit of your organization should find recognition, although an association such as yours, that binds in a common and beneficent brotherhood men from all sections of the Union, banded together for no other purposes except such as are in the highest degree salutary and humane, should everywhere command respect. Your fraternity links you together as members of various communities not only by the sympathy of a common pursuit, but it serves to unite you in common as citizens of this glorious country. For the welfare and progress of that country, as well as for the advantage and interest of your profession, your hearts and your hands and your will are all allied; and here in this city, founded by the immortal Washington, and by a grateful country named by his name, you can imbibe inspirations of patriotism and of pride in the development of a people whose progress is without parallel in the history of the world, and the magnificence of whose destiny no seer dare fathom. (Applause.) It were well that your example were extended to and followed by other pursuits and avocations. This bringing together of the men from Maine and from Texas, of the dwellers on the Atlantic coasts and those from the far off shore where rolls the Oregon, gathering to their ranks as they verge towards the nation's centre, members of commingling localities—no doubt this will have as beneficial an effect upon the body politic as your deliberations and intercourse will advance the interests of the body physical. That success will attend your meeting in both respects there is no room to doubt, and it is a happy omen that you who supply the remedy and the antidote of disease, who are the conservators of the vital forces that make up individual existence, should meet in this beautiful city whence emanates the authority which guards the life and health of the nation. For the preference you have expressed by meeting here, we thank you most heartily, and we rejoice with you that whatever apprehensions were expressed in some directions as to the suitability of this city for the meeting of your National Convention, have been happily dispelled. That the success of your labors may be equal to, and in no sense fall short of, your expectations you have our heart felt wishes, and for the individual advancement and personal advantage of every one of you the hearts of the people of Washington city go out to you all. (Applause.)

On behalf of the Association, the President returned thanks, through General West, to the authorities of Washington, and then proceeded to read the following annual address:

MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

Another year with its rich and varied panorama of events, has unrolled itself into view, and become fixed in history. Privileged and honored as the retiring presiding officer of this noble body, to which position your partiality and the courtesy of your suffrages have summoned me, I ask your attention to a brief report and review of the condition of our Association. Time, in its noiseless movement, glides swifter than a great ship upon the deep, and leaves in its wake the surging lines of events still rising and falling upon the receding sea of the past, into and out of the view of memory. By the gradual movement of the Association into a better and fuller development, the reports of my honored predecessors have at times recalled the history of our organization and its progress, or again reached out into a valuable scientific effort.

On this occasion, I desire to improve the moments of this opening session, by a brief consideration of our actual present condition and position scientific, commercial and social—and to indicate what forward movements the present inspires.

Each year has its landmarks, as well as its inward and outward gate. The year of our history now passed, is distinguished as the close of the third decade of the history of this body, and the pleasure of opening and ushering in the *fourth*, devolves upon the present meeting. Whether the achievements of the future shall equal and surpass the old, remains with us and our successors.

We entered upon the year within sight and hearing of the flash and toss and foam and roar of the vast Niagara; nor have the words of welcome there spoken ceased to resound (like the hum of the cataract) within our hearts, as we stand freshly gathered at the dome of our national strength, and pass in review the shades of the departed greatness of Mt. Vernon, to close with renewals of old friendships, and the striking of new hands, a year so auspiciously begun.

The Great Reaper has been among our ranks to gather into the harvest of death seventeen who have been our active fellow helpers, and one whom we have placed in our honorable list.

Our aged and venerable brother, Daniel B. Smith, of Philadelphia, our first President, departed this life March 29, 1883, in the 91st year of his age. He occupied a very prominent position in connection with the inception and establishment of this Association, and steadily labored most assiduously for its welfare and progress. He was placed upon the roll of honorary members, 1856.

Two brilliant luminaries in the scientific world since our last meeting have also passed away: Prof. Dr. Woehler, for many years Inspector of Pharmacies in the province of Hanover—both as an individual and as an associate of the late Prof. Liebig, he did much to advance chemistry and scientific pharmacy; and Prof. Henry Draper, renowned as an investigator and author in science.

In extending this my official salutation to you, brethren of the Pharmacy of to-day, pardon me if for a moment I indulge in a brief retrospect. I cannot refrain from recalling how few yet remain of the number who assembled here at our last meeting, in the City of Washington, September 14–17, 1858, a round quarter of a century ago. In the exhibit room there may be found a small photographic group, the likenesses of many who then constituted our little company as we stood at Mt. Vernon. We can best compare the subsequent changes in the roll of our active membership with the changes we see around us in this magnificent metropolis, its buildings, its increase in population, wealth and area, fit symbol of the land it centralizes; yet we whose lives are thus inwrought with the past, cannot forget the days of our beginnings, nor the giants who then stood in our ranks, when, in the old Smithsonian Institute, members, delegates from seven States, and a long list of to-be-elected candidates were assembled to open the first morning session. Many of those candidates have since become prominently useful to this Association, and have been honored with high positions in it.

We thoroughly enjoyed the interesting business of the meeting; and, at the close of it, sailed with Captain Baker, on the steamer Thomas Collyer, to the shrine of American loyalty, the tomb of the illustrious Washington. We strolled along the Potomac, beneath the giant forest trees; we witnessed the joy of our late beloved Prof. Procter on finding there a large and beautiful specimen of "Liquidambar styraciflua;" we distinctly remember the animated discussion amongst the members aboard, of the probabilities attending the introduction of the metrical system, together with its practical advantages. Nor have we forgotten the courtesies extended by Mr. John A. Washington, and the honorable privilege of being permitted to hold a special session in the historic precincts of Mt. Vernon; to have access to rooms not usually thrown open to visitors; nor the very valuable "Syllabus of course of study intended for students," and other valuable papers prepared and read by Prof. Procter; the notes and suggestions directed to the Committee on Revision of the New Pharmacopœia, by Dr. Squibb; the practical paper on the "Process of Percolation," by Prof. Graham, and many other valuable papers by the members, together with the reports of the various committees submitted, tended to make it an interesting and instructive occasion.

How few of those old familiar and endeared forms, who were present then, are here with us! Like the veteran monarchs of the forest, the few stand surrounded by the multitudinous growths of newer men, who have come to aid in the useful work of their predecessors. Many of those once so well known and zealous, have gone forever; yet many old and familiar faces encourage us by their presence, and I am glad to behold many new faces, whom I hope to know better.

In all this, there is a strong evidence that the Association has become, what its founders fondly hoped it would be, an elevator of our profession, a teacher of scientific facts, and a leader into the terra incognita of broad, right, free, intelligent research.

The sentinels of the *dawn* are answered by the ranks of the day. The cry of the first decade was, "*We may be;* the fourth decade now opening, gives reply, and says, "*We are.*"

During the twenty-five years, since our last meeting in this city, the steps of advance in professional knowledge may be said to be truly wonderful. No less than three official conventions have been summoned hither: the products of their labors have been the three successive Pharmacopœias; results have shown that each later edition was far in advance of its predecessors; the last revision standing as a promontory of solid worth, a beacon light and guide, rightly called the indisputable authority of our profession, and a safe bridge by which the young practitioner may cross over to usefulness. And it is a gratifying fact, that the committee of revision have each in turn felt the growing influence of this Association; three-fifths of the present committee are honored workers and members of this body.

In addition, we now have a literature, vast and rich, built upon this grand foundation. Commentaries, in the form of carefully-illustrated dispensatories, have appeared, and are even now being prepared, bringing to the active profession, the very latest achievements and results; and these are in turn surrounded by a whole host of publications, so thorough and able, that no profession is better endowed with means of information. The fault is our own, if we do not profit by them.

So wide is the stream of progress now become, and so broadly diversified the channel of our activities, that the question "Whither are we drifting?" may well be asked by one of our contemporaries. The trade, instead of being a *line*, is becoming a series of parallels. Changes of processes and formulas, changes of nomenclature and of opinion, changes in modes of manufacture and of business, may be measured only by going back to a definite halting place, say twenty-five years ago, and comparing *that date* with *this day*. Indeed so continued and so rapid has been the growth and spread of ideas, that truly we may say, "Every breeze whispers change."

In examining the work completed during the year now ended, the usual supply of improvements are to be found. As heretofore, the report of progress of pharmacy, prepared with the accustomed ability and research of our able reporter on progress, Prof. Diehl, will prove a library itself, and a permanent mine of valuable information to all who study it.

This Association has been steadily moving forward, not only keeping pace with the progress of the profession, but moving in the foremost ranks of scientific attainments, until now we can safely say that she stands "the *peer* of any similar institution in the world." The small and seemingly insignificantly *tiny* seed of 1851, became the little lively plant of 1852, that by the growth of each *annual ring*, has become the mighty *trunk*, whose roots and rootlets permeate every where, through State and local associations, draws its life from every district of the land; the good fruits of whose activity hang in abundant clusters, to be tasted by all men, whose leaves are literally "for the healing of the nations."

We have become more truly competent to make available the many discoveries of the year, as well as to present in permanently advantageous form, the new preparations recently developed.

During the past year, the purposes of the Association have been steadily followed. Unity of action, purification of the standard, and increase of the co-efficient of practical ability among ourselves, and our schools, have been the guiding constellations in all our efforts.

The State Associations have held annual meetings regularly, which, like our own, have been largely attended; and because of their educational advantages, have rewarded those who have met to participate in the meetings, to hear the discussions, or who have read the Proceedings. With the pride of the Roman matron, we may point to them and say: "These are my jewels."

I have the pleasure of announcing that, since our last annual meeting, several new State organizations have been effected, and we indulge the hope that ere long every State will have its organization.

The Ontario College of Pharmacy has honored itself by electing to the Chair of Pharmacy, one of our most esteemed and beloved members.

So great has been the march of improvement during the past year, that it would be a superfluous delay were I to enumerate all the many new products developed in that time, and the new industries opened in consequence.

At the last meeting of Congress, a new tariff was passed. The effects on the drug market are important as signifying a simplification of the present rates. The committee on the drug market will, no doubt, refer to it in their report.

The wisdom of establishing the Council, and delegating an ad interim power to it, so as to carry on the activity of this body from meeting to meeting and prepare the way, by a systematic arrangement of the business of our session, has again been proven by the expedition with which our routine work may be transacted, thus giving more time for scientific discussions; the manner in which this work has been done, has deserved our sincerest commendation.

The labors of the Finance Committee during this year, deserve more than a passing notice.

With the valued assistance of the Treasurer, and immense labor, the entire list of personal accounts of each member has been scrutinizingly examined; the result is, that we have an accurate showing of the precise condition of our financial department, and I have the pleasure of stating that our revenues, instead of being borrowed from the future, are fully able to meet, by the past accumulations, all forms of our necessary expenditures. Such disinterested and valuable labor is deserving of thankful praise.

In this connection, I would remind the Association that a series of amendments to our By-Laws, with reference to improving and condensing the routine work of the Committee on Credentials, has been offered, and, doubtless, will come up in proper time for your action.

The committee on increase of membership will present their report, and I would respectfully ask your attention to it, as it is manifest that a continuance of that committee (in some form) would be an advantage to the Association.

In accordance with by-laws of the Council, an advertisement was generally published, offering the interest of the Centennial fund to any investigators who might desire the use thereof. During the year, no response has been received. We therefore urge members having investigations under consideration to avail themselves of its advantages.

The Secretary and Treasurer and Committees of this body, upon the several varied questions and matters in their care, will present their report; diligent consideration and prompt legislation upon them is invoked. We have reciprocated the courtesy of an exchange of delegates, with the National Wholesale Druggists' Association. The warm welcome they received, and the courtesies extended to them, will be reported to you. The continuance of this recently inaugurated exchange of delegates, will redound to the advantage of both Associations.

Pharmacy has a position which is peculiar. Standing as it does between the physician and the people, it takes into consideration its relation to the public, by the dispensation of purest ingredients, and the detection and elimination of the many adulterations and cheap substitutes for the true article demanded, thus winning for our profession the respect and confidence of all.

The medical profession has displayed also a broad share of courtesy toward us. All or nearly all the medical journals give open and equal access to us for discussing questions of Pharmacy and Therapeutics, as well as to the other branches of medical science. This shows the upward tendency of our advancing, and may not this prove the advisability of looking forward toward an exchange of delegates in the near future.

The sentiment seems to be growing in some quarters, that a resort to questionable and unfair uses of our privileges is necessary, in order to secure a competency; but should we fail to consider that we owe it to ourselves to do no mean or underhand act? The ethical code which regulates pharmacy, is all sufficient; we must be laws unto ourselves. Let no one buy or sell in large or small quantities, with the base idea that the profession is to afford him a living; let us procure and dispense only the purest and best. Let all know that the system of striving to undersell our neighbor, is a bad one; that the transformation of a legitimate into a censurable traffic, is always to be condemned. Skill and industry ought to be, and doubtless will be, rewarded with success.

I cannot just here refrain from saying that the relation subsisting between the Association and the State Pharmaceutical Associations is a most important and congenial one, and in future years, with care and judgment, destined to become useful in many ways.

State Associations render prominent aid to us by sending to us their delegates, thus tending to consolidate our National Association by constituting it a harmonizing senate, whereby the good laws of one body become known and adopted by the others. Unity of action is thus enhanced, the entire profession is made more symmetrical, and infant enterprise is cherished.

Though the State Associations, like ourselves, will be interested in the discussion of practical and scientific questions, they will be concerned, rather than ourselves, with the minor details and local peculiarities of the work. Like us, they will expand and develop rapidly, increasing in scientific research as well as numerical strength. Let us patronize them, and they will culminate in us. Let our National Association endeavor to improve them, protect them, enlarge their number till every Commonwealth of this land is endowed with its own organic companionship, and let us expect from each of all these local bodies that support which it is theirs to return to an Association which centralizes and focuses all their efforts to reach common law and elevate our ethical standard.

It is worthy of consideration by us, that, in view of the local and State associations, the attention and labors of our membership are largely diverted, and the number of queries accepted and answered, and volunteer papers presented before us, is numerically less; yet the standard of the productions we receive is continually growing higher, and exhibiting more earnest research and accurate labor.

The prestige won in consequence of the presentation before, and adoption by us, of such papers, will enhance their importance and honor their authors.

In looking over the present status of our business in this country, we find the entire trade sound and prosperous, whilst the growth of population and the rapid development of the various portions of our country, have called for the production of vaster quantities of drugs, chemicals, etc., yet a careful survey fails to discover that the supply is less pure than before. On the contrary, the quality both of drugs and chemicals has been improved.

As to active membership, it is safe to set our number at near 1400; and we appreciate the large number in attendance at this our Thirty-first Annual Convocation. The old members are here with the same zeal they have ever displayed; the new members have come to take their part at our feast of science, to catch the spirit that animates our progress, and to mount the onward-rolling car of the profession.

We thankfully appreciate the interest of those who have labored to prepare for this meeting valuable papers in answer to queries and various important subjects. To give attention to their presentation, and to carefully discuss them, will be but to honor ourselves, as well as justify the authors in their good work.

It is natural to suppose in a world so replete with changes and modulations, an organization called and assembled from all parts of our land, will continually and reciprocally be suggesting and developing improvements. Our obligations to this Association, and to each of its members, point us ever onward and upward. Let this earnest advancement ever continue!

"Duty unloved, becomes a grievous burden; but loved and obeyed, it is worn as a delightful privilege, a badge of usefulness, a crown of honor."

Changes in our past experience teach us that we justly anticipate more marvellous development and wider improvements in the future than the present knows of.

The introduction of new remedies, new opinions, new formulæ, and new modifications of our work, will be continued. Even the pharmacopœia, though at present so complete, ample and thorough, will in time become antiquated, and like the fabled Phœnix, give origin out of itself to another.

A new British pharmacopœia is being compiled under the direction of the General Council. By this arrangement, the work, though practically done by pharmacists, is not legally recognized as such. The Pharmaceutical Society of Great Britain can only recommend, though it now contends for higher privileges in this regard.

In view of the relation of the National and State Associations, previously referred to, and of the adoption and use in our several States of laws widely divergent, and as well of the recommendations now pending without agreement, or soon to be laid before various State Legislatures for adoption, the suggestion advocated by many members from every region submitted, that a "National Pharmaceutical Act," embodying the fundamental principles of all our States, and bringing all into more perfect harmony and union, providing for mutual sustentation, and encouraging the organization of new Associations—ought to be speedily drawn up, to be enacted and effectuated by Congress as early as may be. This will also be an aid to those Associations and States who are anxious to have permanent laws, but have been unsuccessful in obtaining them from their own Legislatures.

The recent ex-President of the Pennsylvania Pharmaceutical Association suggested that such an act should be very general in its character, a mere outline or skeleton, to be filled up by the several States with such specific rules and regulations as their different circumstances may warrant.

If such a law, not conflicting with the Constitution of the United States, could be enacted, it would be exceedingly desirable.

The resolutions offered at our last meeting, urging Congress to recognize more fully the services, and elevate the condition and standing of the apothecaries of the army and navy, by suitably ranking them, have been forwarded to the proper committee, but have not been acted upon. I would recommend that a renewal of the effort be made to next Congress. The welfare of the entire army and naval arms of the service is contingent upon having men of high standing as its dispensers.

The roll of life membership of our Association is increasing from year to year. The amount realized from this source is being placed in the permanent fund.

I call your attention to the good that will be accomplished in all the future years by members supplying, as it were, in advance, the amount for all future dues—the interest of these invested funds, being available to the Association for all time to come, even after the death of the member. Thus the accumulations of the life members' fund will, if increased by new contributions, enable the Association to reduce the annual dues.

It is earnestly recommended that the list of life members be increased.

The foundation stones of a National Retail Druggists' Association have already been laid, and its permanent establishment upon a firm and substantial basis is now a certainty. In view of the fact that we have so much in common with this new body, the proposition to exchange delegates might fairly be considered.

In this connection I may be permitted to say a word concerning another Association—the International Congress to be held next year in the city of Brussels. Whether it is desirable to be represented, it is for you to determine. We would suggest that the entire matter be referred to the Council; and if, in their judgment, they should find it possible to supply a representation in that Convention in the person of one or more of your members, who may visit Europe at that time, that the honor be entrusted.

The International Pharmaceutical Exhibition was held in Vienna, last August. These occasions become interesting, both on account of the vast variety of Materia, and the number of nations interested.

The educational factor of an exhibition like this would be much increased, if processes and practice of pharmacy in the different countries were to be set forth in connection with the finished products.

As one of the highest motives of this Association is the encouragement of the spirit of research, and the elevation of the standard of our profession, we cannot urge too strongly, or reiterate too often, the urgent necessity of more thorough education. Most cordially should the words of my honored predecessor be accepted by all, with regard to collegiate education, and the masterly way in which our institutions have been conducted. These nurseries of our profession deserve the highest commendation we can bestow.

But we should not fail to note that as the clinic is an important factor in the healing art, so in the development in *the future* practitioner in pharmacy, much depends upon the laboratory and the employer.

The apprentice boy at the counter and scales, needs most, and ought to have, judicious and thorough encouragement and development by hisemployer. The eye of the master will do more work than both his hands, if *he* succeeds in directing his clerks to follow and attain to the level of excellence, or greater, reached by himself, and inspiring them with the same love for the duties of the profession we enjoy.

Justice demands that a statement should here be made concerning the worthless pills, inert drugs, and other useless medicines, which after being condemned by the medical examiners of the government as unfit for hospital use, are collected and disposed of at public sale to the highest bidder. Though these damaged goods are sold, as represented by the government, we believe that a vast wrong is committed. If the government rightly refuses to admit worthless drugs into the country, consistency demands the entire destruction of those of a very doubtful character. I suggest, that in acccordance with the spirit that led to our organization, and in compliance with the articles of our constitution, we protest against any such future sales being made.

By the regular and successful work of the Council, and the excellent management of the officers, the continued prosperity of the Association is assured. I can only recommend the thorough enforcement of the all-sufficient constitution, by-laws and resolutions in the future, as in the past.

The subject of the photographic album and the collection of the pictures of the members, should not be abandoned.

In view of the fact that we are free from all financial encumbrance, it would perhaps be wise to hold each alternate meeting in one of the smaller cities, so as to aid and encourage the laborious efforts of the pharmacists of smaller towns.

Our Committee on Entertainment, with the assistance of the Local Secretary, have been assiduous in their labors for our comfort and pleasure, and should receive our praise; but it is suggested for your consideration, that in the future the subject and character of our entertainments, and the time of holding our sessions at the annual meetings, and the manner of providing for the same, be referred to the Council for their supervision and direction, as part of their official duties, as already prescribed by Chap. 6, Art. 1, of the by-laws.

This session we now open is full of promise. Questions touching every depart- of our work will be brought forth to the light of your investigation, carrying with them suggestions and ideas useful to ourselves and valuable to the whole profession. Let us take them up fairly, discuss them considerately, act upon them justly and prudently, and reduce them to practice. So shall the best results return upon ourselves and the institutions of our profession we have the honor to represent.

Having now given you some idea of the great good work we are in and supporting, I desire only to congratulate you upon the past achievements, present standing, and promising outlook—while I return to you, gentlemen, fellow members. one and all, my sincere thanks for the uniform courtesy with which you have sustained me and my brother officers in bearing the duties of our high and responsible positions.

The address was, on motion of Mr. Remington, referred to a committee of three, for the purpose of considering the recommendations, and reporting thereon at a subsequent session.

The chair appointed Messrs. Shinn, of Philadelphia; Gordon, of Cincinnati, and Saunders, of London, Ont.

The Council reported, through the Permanent Secretary, the following list of accredited delegates:

To the Council of the American Pharmaceutical Association:

The Permanent Secretary respectfully reports that for the purpose of facilitating the examination of credentials, under the new rules, suitable blank forms were prepared and one copy thereof mailed to either the secretary or president of every College of Pharmacy and Pharmaceutical Association in North America, of whose existence he was aware. In his official call for the Thirty-first Annual Meeting, the President called attention to the requirement of the By-Laws, that the credentials should be sent to the Permanent Secretary at least two weeks in advance of the annual meeting. After the expiration of this time, August 29th, the Permanent Secretary had received credentials from six Colleges of Pharmacy, from two Alumni Associations, from thirteen State Pharmaceutical Associations, and from eight County and other local Pharmaceutical Associations; total, twenty-nine organizations. Of this number, only four had not made use of the blanks supplied, and had omitted to furnish the names and addresses of their presidents and secretaries. The following is a complete list of all delegations, whose credentials have been received up to the time of the present meeting:

COLLEGES OF PHARMACY.

California.—Emlen Painter.

Chicago.—Henry Biroth, R. H. Cowdrey, Theo. H. Patterson, J. H. Wilson, C. G. Wheeler.

Louisville.—C. Lewis Diehl, Emil Scheffer, O. A. Beckmann, H. H. Rademaker, E. C. Pfingst.

Maryland.—Edwin Eareckson, C. F. Emich, Jos. Roberts, Louis Dohme, Chas. Caspari, Jr.

Massachusetts.—Thos. Doliber, S. A. D. Sheppard, B. F. Stacey, H. K. Appleton, Henry Canning.

National (*Washington, D. C.*).—G. G. C. Simons, H. A. Johnston, W. S. Thompson, John A. Milburn, J. R. Walton.

New York.—H. B. Parsons, Chas. Rice, H. J. Menninger, G. J. Seabury, Paul Lehlbach.

Ontario.—Edward Harvey, Wm. Saunders, W. S. Robinson, W. B. Sanders, Edmund Gregory.

Philadelphia.—Alonzo Robbins, Robert England, Gustavus Pile, James T. Shinn, Chas. W. Hancock.

Pittsburg.—C. H. Beach, Louis Brehm, Albert H. Wilson, L. Emanuel, W. W. Nisbet.

St. Louis.—J. M. Good, Chas. O. Curtman, Gust. Koch, Wm. H. Crawford, Oscar Oldberg.

ALUMNI ASSOCIATIONS.

Chicago.—R. H. Cowdrey, Thos. Whitfield, F. G. Somers, Thos. W. Sollet, Jas. M. Kirkley.

Massachusetts.—Geo. F. H. Markoe, B. F. Davenport, W. W. Bartlet, Freeman H. Butler, G. F. Dinsmore.

Philadelphia.—Dr. Adolph W. Miller, C. Lewis Diehl, Chas. W. Hancock, Lucius E. Sayre, Dr. Chas A. Weidemann.

St. Louis —Francis Hemm, Chas. O. Curtman, M. D., G. H. M. Goehring, Louis Schurck, J. W. Tomfohrde.

Washington (*National College*).—H. E. Kalusowski, A. Hofer, A. Muncaster, A. M. Read, L. Kolopinski.

STATE PHARMACEUTICAL ASSOCIATIONS.

Alabama.—P. C. Candidus, J. O. Patton, A. L. Stallenwerck, H. B. Fee, S. D. Lozerus.

Arkansas.—J. B. Bond, G. A. Hughes, W. H. Halliburton, J. W. Turner, J. L. Zimmerman.

Connecticut.—Dwight Phelps, Emil A. Gessner, Chas. A. Rapelye, Frederick B. Edwards, Walter R. Francis.

Georgia.—Theo. Schumann, L. W. Hunt, N. I. Brunon, G. W. Staufer, S. C. Durban.

Illinois.—M. Williams, A. E. Ebert, T. H. Patterson, A. G. Vogeler, G. P. Englehard.

Indiana.—Leo Eliel, H. J. Schlaepfer, Geo. H. Andrews, Jos. K. Lilly, E. V. Pyle.

Iowa.—A. G. Anderson, W. C. Bryant, C. W. Rogg, J. W. Ellis, W. H. Hardy.

Kansas.—M. L. Stone, R. J. Brown, W. N. Stanford, Geo. Slosson, Geo. Leis.

Kentucky.—C. L. Diehl, E. C. Pfingst, C. I. Warren, W. H. Averill, Jeff. Oxley.

Louisiana.—Alex. K. Finlay, John B. Larigne, John Johnson, R. N. Girling, Jos. T. Thibodeaux.

Massachusetts.—F. M. Pease, Henry Canning, H. M. Whitney, C. B. Emerson, E. B. Frothingham.

Mississippi.—J. W. Eckford, John P. Finlay, J. H. Athin, F. A. Duks, A. F. Wist.

New Hampshire.—C. A Tufts, Chas. F. Hildreth, Geo. F. Underhill, Stephen F. Sanderson, Robert C. Dickey.

New Jersey.—H. P. Thorn, Wm. Rust, M. Abernethy, Chas. G. AmEnde, Wm. R. Laird.

New York.—Aaron Sagar, H. W. Atwood, J. Riefenstahl, G. M. Kenyon, W. H. Rogers.

North Carolina.—W. Simpson, E. V. Zœller, E. H. Meadows, A. P. Thorp, H. O. Furman.

Ohio.—J. A. Nipgen, I. H. Reed, A. Mayell, J. J. Heck, J. V. Fisher.

Pennsylvania.—J. P. Remington, Chas. T. George, E. A. Cornell, Chas. C. Klump, J. A. Meyers.

South Carolina.—G. J. Luhn, C. F. Panknin, B. F. Moise, A. W. Eckel, C. O. Michaelis.

Texas.—W. J. Morley.

Virginia.—C. P. Benson, J. A. Wells, O. T. Mingsa, T. Roberts Baker, J. W. Thomas, jr.

West Virginia.—E. Bocking, E. L. Boggs, E. W. Shrewsbury, A. N. Williams, C. Menkemeller.

Wisconsin.—F. Robinson, J. C. Huber, John R. Drake, F. F. Prentice, J. M. White.

COUNTY, ETC. PHARMACEUTICAL ASSOCIATIONS.

Albany County, N. Y.—A. B. Huested, M. D., Chas. H. Gaus.

Kings County, N. Y.—Wm. P. DeForest, L. E. Nicot, E. A. Sayre, L. T. Perkins, T. D. McElhenie.

Lancaster County, Pa.—H. B. Cochran, John R. Kauffman, Alfred A. Hubley.

Lynn, Mass.—Jas. B. Small, Chas. W. Brown, Jos. W. Colcord, Jos. H. Hart, Edward B. Gordon.

Newark, N. J.—Chas. Holzhauer, Wm. M. Townley, R. W. Vanderwort, S. L. Rumsey, D. Wood Brant.

New York German Apothecaries.—Carl Schur, Carl E. Kessler, Ad. Tsheppe, H. J. Menninger, Louis Stoff.

Petersburg, Va.—John A. Wells, Chas. L. Wright, Edward R. Beckwith, Geo. A. Minstrel, Geo. C. Starke.

Richmond, Va.—John B. Purcell, Henry Bodeker, Hugh Blair, John W. Pierce, Wm. H. Scott.

Dauphin County, Pa.—D. W. Gross, Chas. T. George. J. H. Boher, J. W. Hoffa, J. A. Miller.

Erie County, N. Y.—Horace P. Hayes, Wm. H. Tibbs, C. O. Rano, Thos. Stoddart.

Washington, D. C., (*Phar. Association.*)—R. B. Ferguson, T. G. Demoll, C. H. Fickling, D. K. Helfenstine, A. J. Schafhirt.

Washington, D. C., (*Registered Drug Clerks.*)—F. Luerssen, F. C. Henry, J. T. Cole, W. S. Richardson, E. Gladmon.

Cleveland, O.—A. Mayell, A. May.

Orleans (*New Orleans, La.*)—C. L. Keppler.

Indianapolis.—Geo. W. Sloan, Emil Martin.

On motion of Mr. Remington, the calling of the roll was dispensed with, after which the Secretary of Council read the applications for membership, which had been examined by the Council.

Mr. Saunders offered the following resolution:

Resolved, That the gentlemen present of the following organizations be invited to the privileges and courtesies of the floor during our meetings:

The members of the Medical Association of the District of Columbia; the Officers of the Medical Department of the Army and Navy, and of the Marine Hospital Service;

the Professors of the Medical Colleges of the District of Columbia, and the Regents and Officers of the Smithsonian Institution.

The resolution was adopted.

The following letter was read by the Permanent Secretary :

WASHINGTON, D. C., *September* 11, 1883.

The Pharmacists of Washington respectfully invite the visiting members of the American Pharmaceutical Association, with their ladies and friends, to join in an excursion to Mount Vernon, at 2 o'clock p. m. on Friday, the 14th, tendered in honor of the Thirty-first Meeting of the American Pharmaceutical Association.

All not yet provided with admission tickets, will be supplied on application at the clerk's desk, in the main entrance to the building.

In order that all of the visiting members may participate in the excursion, I am instructed to request the Association to agree to adjourn sine die at 12 m. on Friday.

Very respectfully submitted, J. R. CASSIN,
Chairman of Committee.

The invitation was accepted with thanks; likewise one from Mr. C. B. Shafer, inviting the members to visit his depot of natural mineral waters.

The following committees, being called upon, stated to be ready to report: Committee on the Drug Market; Committee on Papers and Queries; Committee on Prize Essays; Committee on Legislation; Committee on the Proposed Meeting in California, and the Committee to Visit the National Wholesale Druggists' Association.

The appointment of the Nominating Committee being next in order, the different delegations made the following selections:

COLLEGES OF PHARMACY.

California	Eml. Painter.
Chicago	T. H. Patterson.
Cincinnati	J. D. Wells.
Louisville	E. C. Pfingst.
Maryland	Chas. Caspari, Jr.
Massachusetts.	W. W. Bartlet.
National (Washington, D. C.)	J. A. Milburn.
New York	Chas. Rice.
Ontario.	Wm. Saunders.
Philadelphia	C. W. Hancock.
Pittsburg.	L. Emanuel.
St. Louis.	Gust. Koch.

ALUMNI ASSOCIATIONS.

Chicago	R. H. Cowdrey.
Massachusetts.	G. F. H. Markoe.
Philadelphia	L. E. Sayre.
St. Louis.	J. W. Tomfohrde.

STATE ASSOCIATIONS.

Alabama.	P. C. Candidus.
Arkansas	J. L. Zimmerman.

Connecticut	D. Phelps.
Georgia	J. W. Stanford.
Illinois	A. E. Ebert.
Indiana	Leo Eliel.
Iowa	W. C. Bryant.
Kansas	Geo. Slosson.
Kentucky	W. H. Averill.
Louisiana	A. K. Finlay.
Massachusetts	Henry Canning.
Mississippi	J. W. Eckford.
New Hampshire	C. A. Tufts.
New Jersey	H. P. Thorn.
New York	W. H. Rogers.
North Carolina	Wm. Simpson.
Ohio	J. A. Nipgen.
Pennsylvania	C. T. George.
South Carolina	G. J. Luhn.
Texas	W. J. Morley.
Virginia	C. P. Benson.
West Virginia	E. Bocking.

COUNTY OR OTHER LOCAL ASSOCIATIONS.

Kings county, N. Y	W. P. De Forest.
Lancaster county, Pa.	A. A. Hubley.
Lynn, Mass.	J. W. Colcord.
Newark, N. J.	S. L. Rumsey.
New York German Apothecaries.	H. J. Menninger.
Petersburg, Va.	J. A. Wells.
Richmond, Va.	Henry Bodeker.
Dauphin county, Pa	J. A. Miller.
Erie county, N. Y.	W. H. Tibbs.
Washington Registered Drug Clerks	F. Luerssen.
Cleveland.	A. Mayell.
Orleans.	C. L. Keppler.
Indianapolis	G. W. Sloan.

The President made the following additional appointments from the members not present as delegates: Messrs. Emil Scheffer, Louisville; J. H. Redsecker, Lebanon, Pa.; J. Basset, Salem, N. J.; A. R. Bayley, Boston, and Rob. England, Philadelphia.

The Secretary of Council read the minutes of this body, which were on motion approved. These minutes give the following information:

> Four sessions were held since the last report, namely at Niagara Falls, September 15th, 1882; at Philadelphia, April 12th, 1883, and at Washington, September 10th and 11th, 1883.
>
> A committee consisting of Messrs. Saunders, Lemberger and Diehl, was appointed to confer with the Chairman of the Committee on Papers and Queries, for the purpose of devising a plan for the protection of the papers belonging to the Association.

The following report of the Finance Committee was read, discussed, and the recommendations adopted :

To the Chairman of the Council of the American Pharmaceutical Association—DEAR SIR :—The Finance Committee of the Council respectfully submit the following report :

The Committee met at the Astor House, New York, February 8th, and proceeded to make a careful and minute examination of the Treasurer's books, accounts, vouchers, funds, etc., etc., embodying the whole of the financial affairs of the Association.

Every one of the accounts in the ledger. about fifteen hundred in number, were examined and compared with the entries of 1882, in the cash book relative thereto.

This duty, together with other examinations, occupied the better part of two days and a half.

The report of the Treasurer accompanying this report gives a statement in detail of the finances of the Association for the year ending January 1st, 1883. The Committee hereby certify that this report of the Treasurer is correct.

The cash balance of forty-eight hundred forty-four and $\frac{78}{100}$ dollars, shown on the Treasurer's Report, is on deposit with the New England Trust Company, of Boston, in the name of the Association, and is drawing interest.

The Ebert, Centennial and Life Membership Funds are invested in four per cent. Government bonds, such small balances as belong to each fund being deposited in a Savings Bank in Dover, N. H., each balance in a separate account.

These bonds and savings bank books are correct, and correspond in numbers and amounts with the numbers and amounts as shown by the Treasurer's books.

The Committee's examination suggested to them several changes in the manner of keeping the Treasurer's books, by means of which the books will show more clearly the condition of the finances of the Association.

These changes have been suggested to the Treasurer. He heartily approves the same, and will adopt them during the financial year commencing January 1st, 1883.

As the Treasurer of the Association is not required to give bonds, the finances should be so arranged that no funds can be drawn without the knowledge and consent of some other officer of the Association, acting in concert with the Treasurer.

It seems highly desirable that in addition to the necessarily superficial work of an Auditing Committee at the Annual Meeting, there should be a thorough and careful examination of the financial affairs of the Association at least once a year by an authorized committee. Such examination may very properly be made at the end of our financial year, which is now the same as the calendar year.

As shown by the experience of the Committee this year, this examination may occupy a very considerable amount of time ; therefore, for the sake of convenience to the members of the Committee, and as a matter of economy to the Association, it would seem to be wise for the Council to appoint annually an Examining Committee for this purpose, said Committee to consist of members residing in the same city or town.

In conclusion, the Committee recommend the adoption, by the Council, of the following :

GENERAL RULES ON FINANCE.

First. The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second. Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third. All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth. The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth. The Chairman of the Council shall be the custodian of the bonds and saving-bank books representing the several funds belonging to the Association; said bonds and bank books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council.

Sixth. There shall be annually appointed, by the Council, an Examining Committee; this Committee to consist of three members residing in or near the same city or town, the chairman to be a member of the Finance Committee.

Seventh. The Treasurer shall balance his books January 1st, of each year, and shall make out, previous to the first day of February following, his annual report for the financial year just closed.

Eighth. The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report to the Chairman of the Examining Committee, at such time and place in February of each year as said chairman may direct.

The Chairman of the Council shall forward to the Chairman of the Examining Committee, at the same time and place, the bonds, savings banks books, and accounts of the same that may be in his hands.

Ninth. Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, saving bank books and accounts of the same, to the chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Examining Committee.

Tenth. There shall be a meeting of the Examining Committee in February of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and, previous to the 1st day of March following, to make a report thereon, in writing, to the chairman of the Council.

Signed,

S. A. D. SHEPPARD,
JOS. L. LEMBERGER,
H. J. MENNINGER,
Finance Committee.

No. 1. *Dr. Cash.*

To Balance on hand Jan. 1, 1882	$3207 13
To Amount received for *Contributions* to Sept. 1, 1882	2270 00
" " *Memberships*	55 00
" " *Certificates*	35 00
" " *Proceedings*	39 35
	$5606 48

Cr.

Date.	*No.*	*Voucher.*	*Proceedings.*	*Expenses.*
1882.				
March 31.	1.	By paid F. Gutekunst	$82 00	
April 7.	2.	" Louis Dreka	17 50	
" 9.	3.	" German Insurance Co		$15 00
May 23.	4.	" John M. Maisch		290 93
" "	5.	" " Salary (balance)		500 00
" "	6.	" Chas. A. Tufts, "		500 00

June	1.	7.	"	Sherman & Co.	500 00	
"	24.	8.	"	Geo. W. Kennedy.		183 20
July	4.	9.	"	William Rutter & Co.	200 00	
Aug.	11.	10.	"	Sherman & Co	400 00	
"	24.	11.	"	"	652 08	
"	25.	12.	"	William Rutter & Co.	112 80	
"	28.	13.	"	Chas. A. Tufts.		89 21
"	"	14.	"	"		82 66
					$1964 38	$1661 00
						$1964 38
						$3625 38
				Balance to new account		1981 10
						$5606 48

No. 1. *Dr. Cash.*

To Balance on hand Sept. 1, 1882	$1981 10
To Amount received for Contributions to Jan. 1, 1883	3065 00
" " Memberships	565 00
" " Certificates	262 50
" " Interest.	17 00
	$5890 60

Cr.

Date.		*No.*	*Voucher.*		*Proceedings.*	*Expenses.*
Sept.	14.	15.	By paid	C. Lewis Diehl	$500 00	
"	15.	16.	"	John M. Maisch.		$32 00
"	"	17.	"	"		20 45
"	"	18.	"	Cyrus R. Morgan	100 00	
"	"	19.	"	George W. Kennedy.		100 00
Oct.	1.	20.	"	Charles A. Tufts		49 69
"	18.	21.	"	the Ebert fund		128 00
"	"	22.	"	William M. Clark	46 00	
Dec.	30.	23.	"	Charles A. Tufts.		69 68
					$646 00	$399 82
						646 00
						$1045 82
				Balance to new account		4844 78
						$5890 60

No. 2.

Dr. *Cash.*

1883.			
Jan.	1.	To *Balance* on hand January 1, 1882	$3207 13
		To amount received for *Contributions* in 1878	15 00
		To amount received for *Contributions* in 1879	70 00
		To amount received for *Contributions* for 1880	240 00
		To amount received for *Contributions* in 1881	1580 00
		To amount received for *Contributions* for 1882	3430 00
		To amount received for *Memberships*	620 00
		To amount received from the sale of *Certificates*	295 00
		To amount received from the sale of *Proceedings*	41 85
		To amount from *Interest* on deposits	17 00
			$9515 98

Cash.

		Cr.
By cash paid for the expense of the *Proceedings:*		
Sherman & Co., printing	$1552 08	
William Rutter & Co., binding	312 80	
Cyrus R. Morgan, Phon. reporter	100 00	
F. Gutekunst, photographs	82 00	
Louis Dreka, engraving	17 50	
William M. Clark, engraving	46 00	
C. Louis Diehl, salary as reporter of the Progress of Pharmacy, from September '81 to September '82	500 00	
		$2610 38
John M. Maisch, balance of salary from September 1881 to September 1882	500 00	
John M. Maisch, miscellaneous expenses, including expenses attending the meeting at Niagara Falls, N. Y., printing, stationery, freight, expressage, packing boxes and postage	343 38	
Charles A. Tufts, salary from September 1881 to September 1882	500 00	
" " miscellaneous expenses including expenses attending the meeting at Niagara Falls, N. Y., printing, stationery, expressage, filling out certificates, postage, and the expenses of collectors in cities	291 24	
George W. Kennedy, salary as Secretary of the Council from September 1881 to September 1882	100 00	
George W. Kennedy, miscellaneous expenses, including printing and postage	183 20	
Insurance of the property of the American Pharmaceutical Association, stored in the Philadelphia College of Pharmacy	15 00	
Paid to *Ebert Fund*	128 00	
		$2060 82
		$4671 20
Balance to new account		4844 78
		$9515 98

No. 3.

Statement to January 1st, 1882.

Balance on hand September 1, 1881	$1627 06
Amount received from *Contributions* to January 1, 1882	2180 00
Amount received from the sale of *Certificates* to the same date	382 50
	$4189 56
Paid for *Expenses* to January 1, 1882	$335 43
Paid for *Proceedings* to the same date	600 00
Paid for *Certificates*	47 00
	$982 43
Balance on hand January 1, 1882	3207 13
	$4189 56

No. 4.

The list of *Life Members* has not been increased the past year.

No. 5.

The *Investments* are as follows:

Ebert Fund in United States 4 per cent. Registered Bonds	$596 25
Do. deposited in the Saving Bank for the County of Strafford	78 25
Centennial Fund in United States 4 per cent. Registered Bonds	1192 50
Do. deposited in the Savings Bank for the County of Strafford	27 17
Life Membership Fund in United States 4 per cent. Registered Bonds	715 50
Do. deposited in the Savings Bank for the County of Strafford	31 58
Total amount of Investments	$2641 25

No. 6.

Dues to the Association.

From members for 1878	$ 25 00
" " " 1879	30 00
" " " 1880	110 00
" " " 1881	430 00
" " " 1882	1965 00
" certificates	15 00
Total	$2575 00

No. 7.

Due by the Association.

From September 1st, 1882, to January 1st, 1883.

To C. Lewis Diehl	$167 00
To John M. Maisch	200 00
To Charles A. Tufts	167 00
To George W. Kennedy	33 00
	$567 00

No. 8.

Resources of the Association.

Cash on hand (see Bank account)	$4844 78
Prospective and considered good (see Table No. 6)	2575 00
	$7419 78
Deduct bills as per Table No. 7	567 00
	$6852 78
Investments as per Table No. 5	2641 25
Total	$9494 03

The thanks of the Council were tendered to the Finance Committee for the efficient manner in which they had performed their whole duty.

A letter from the Secretary of the Pharmaceutical Society of New South Wales, acknowledging the receipt of a set of Proceedings from the American Pharmaceutical Association, was read and filed; likewise letters from the Honorary Members elected at the last meeting.

A communication from Dr. Stieren, offering a set of microscopic drawings, was received; the Council declined to negotiate for the purchase of the same.

The following resolution was adopted:

Resolved, That while it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer, of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible.

A sum, not exceeding $125, was appropriated (of which sum $101 was used), for issuing circulars and application blanks for membership; also, $500 for preparing the report on the Progress of Pharmacy for the current year; also, $175 for compensation to the Chairman of the Committee on Membership, and $25 for compensation to the Secretary of the Council.

The name of Alfred B. Taylor, a member of the Association since its organization in 1852, was ordered to be placed upon the roll of life members; and on special information received, the claims against Wm. R. Fenner were deferred. The name of T. H. Patterson was ordered to be restored to the roll of members.

It was decided to publish, in the next Proceedings, the picture of the late William Neergaard.

The credentials of the delegates to the Washington meeting were examined, and the reports of the Committees on Publication and on Membership were received and referred to the Association; also a number of applications for membership.

REPORT OF COMMITTEE ON PUBLICATION.

The Committee respectfully reports that the manuscript for the last volume had all come to hand by the middle of October, and the wood-cuts were ready about the middle of November, 1882. The cuts were mostly loaned by the publishers of "New Remedies," and of the "American Journal of Pharmacy;" several also by the publishers of the "Pharmacist" and the "Druggists' Circular." The volume was distributed early in April last to those entitled. The cost of publishing 1,600 copies was as follows:

Phonographic report		$ 100 00
Composition, paper, press-work		1885 64
Binding and wrapping		334 58
Phototype		81 50
Journals for use of report on Progress of Pharmacy:		
For 1882	$29 03	
For 1883	12 25	
		41 28
Wood-cuts		46 00
Incidental expenses of the Secretary:		
Packing boxes	$ 9 20	
Freight and expressage	71 60	
Postage stamps	179 10	
Stationery, certificates, etc.	16 70	
		276 60
Salaries of reporter and secretary		1100 00
Total		$3865 60

The following stock of Proceedings is on hand, stored at the Philadelphia College of Pharmacy:

1851.	304 in paper.		
1852.	81 “		
1853.	82 “		
1854.	54 “		
1855.	97 “		
1857.	247 “	15 bound.	
1858.	56 “	4 “	130 loose.
1859.	— “	36 “	
1860.	— “	195 “	
1862.	— “	274 “	
1863.	— “	265 “	
1864.	178 “	111 “	
1865.	154 “	21 “	
1866.	67 “	75 “	
1867.	151 “	80 “	

1868.	50 in paper.	148 bound.
1869.	99 “	141 “
1870.	111 “	92 “
1871.	96 “	56 “
1872.	98 “	3 “
1873.	15 “	99 “
1874.	130 “	23 “
1875.	64 “	41 “
1876.	42 “	46 “
1877.	42 “	70 “
1878.	63 “	106 “
1879.	23 “	93 “
1880.	83 “	40 “
1881.	51 “	60 “
1882.	53 “	108 “

The insurance on the above and other books remains the same as for a series of years past, it being $2500, in the German Fire Insurance Company of Philadelphia, at a premium of $15.

JOSEPH P. REMINGTON,
C. LEWIS DIEHL,
JOHN M. MAISCH.

REPORT OF COMMITTEE ON MEMBERSHIP.

TO THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION: In compliance with the By-Laws of the Council, the Committee presents the following report. A revised roll of membership was published with last Proceedings.

REPORT OF MEMBERSHIP.

Members in good standing at last report	1286	
Members elected at last meeting	124	
Members who became members as delegates by complying with the By-Laws	4	
Members who were dropped, having paid up their arrearages, were placed on the roll from time to time	31	
Making a total membership of		1445

LOSS IN MEMBERSHIP.

By resignation	8	
Dropped from the roll for various causes	37	
By death	18	
Total loss		63
Leaving a balance at this report of		1382

HONORARY MEMBERSHIP.

Number at last report	20
Elected at last meeting	11
Total	31
Loss by death	1
Balance at this date	30

Of the thirty honorary members, there is not one from our own country; the only member the Association has had for several years was Daniel B. Smith, of Philadelphia, who died since our last meeting.

The membership of the Association is distributed throughout the United States, Canada, etc., as follows:

Alabama	7	Nebraska	2
Arkansas	4	Nevada	1
California	23	New Hampshire	25
Colorado	7	New Jersey	63
District of Columbia	22	New York	279
Connecticut	29	North Carolina	16
Delaware	2	Ohio	124
Florida	4	Oregon	1
Georgia	18	Pennsylvania	158
Illinois	63	Rhode Island	14
Indiana	46	South Carolina	9
Iowa	26	Tennessee	8
Kansas	14	Texas	9
Kentucky	36	Vermont	9
Louisiana	11	Virginia	9
Maine	20	Washington Territory	2
Maryland	41	West Virginia	9
Massachusetts	129	Wisconsin	20
Michigan	24	Dominion of Canada	22
Minnesota	6	Bermuda	1
Mississippi	6	United States of Colombia	1
Missouri	62	Members residing in Europe	4

Your committee, according to instructions, sent out 5,000 blank applications and a corresponding number of circulars, to druggists residing principally in the South. The expenses connected with this work were as follows:

Printing applications, circulars, envelopes	$44 25
Postage	50 00
Printed directions	6 75
Total	$101 00

Which has been paid.

The circular was similar to the one sent out last year.

A number of applications have been received and reported to the Council.

At this date about sixty members are liable to be dropped for non-payment of dues; but it is hoped that many of these will pay up before the proceedings are published. Twenty-four former members of the Association, who have severed their connection, have failed to return their certificate of membership.

Since the last annual report, and up to the present time information of the death of nineteen members has been received, and the following biographical notes have been furnished. The names are as follows—several of these are on the list of deceased members, Proceedings 1882:

Ulrich Heyerdahl, Parker, Dakota Ter.
Auburn Smith, London, O.
Robert J. Toplis, Yonkers, N. Y.
W. T. Bray, Wingham, Canada.
Stephen L. Talbot, Providence, R. I.
Wm. Moll, Saginaw City, Mich.
Frank L. Vreeland, San Francisco, Cal.
Chas. J. Powers, Syracuse, N. Y.
Chas. Hodge, Portland, Oregon.
Theodore Kalb, St. Louis, Mo.
Edward H. Luckenbach, Bethlehem, Pa.
L. Harwood, Warren, Mass.
Wm. S. Merrill, Cincinnati, Ohio.
D. B. Smith, Philadelphia, Pa.
Bruce Huling, Cleveland, Ohio.
Francis Drischler, New York City.
James Weaver, New York City.
Saml. E. Tyson, Washington, D. C.
Henry Kelsey, Jr., New Haven, Conn.

Mr. Heyerdahl died at Parker, Dakota, September 16, 1882, of consumption. He was born in Norway, November 17, 1848, and was therefore in the thirty-ninth year of his age. He came to this country in 1865, and located in Chicago as a drug clerk. Like many others, he soon become imbued with the western fever, went to Iowa and obtained a situation in Decorah, where he remained till 1870, when he proceeded to Sioux City, Iowa. Some time afterwards he formed a partnership with F. Hanson, and opened a wholesale and retail store. Here he worked hard to build up a good business, and here it was that he contracted the sickness which carried him away. He recovered in a measure from the first severe attack; but for ten years he battled with the dread disease, in the mean time returning for a year to his native land, Norway. He improved rapidly; and, certain of eventual recovery, he came back to America, locating at Swan Lake, D. T., where he opened a store. He conducted the drug business for three years but too close application to the store brought on the old complaint. He was compelled to sell out; and, after traveling about in search of health, which improved some, he went into the drug business at Fairbault, Minnesota, for a short time.

The deceased was a highly educated apothecary, and by all who knew him was honored and respected. He became a member of our Association at the meeting held at Saratoga Springs, N. Y., 1880.

Mr. Auburn Smith, of London, Ohio, died there of Bright's disease, October 10, 1882. The deceased was born in Somerford, Ohio, December 14, 1839, and consequently was in his forty-third year. He went to London with his parents in 1843, where he remained permanently the balance of his life. He studied the drug business with his father; and, after his father's death, he embarked into the trade for himself. Accordingly, in the year 1863, he formed a co-partnership with J. S. Davidson, which lasted three years, when Mr. Smith assumed entire control, continuing the business until death. His gentlemanly deportment and congenial manners made him universally popular, not only in his commercial but also in his social relations. In 1863, he was married to Miss Anna Arnett, of West Jefferson, and to them were born five children, three boys and two girls. The deceased became a member of this Association at the meeting held at Saratoga Springs, N. Y., 1880.

Mr. Robert J. Toplis, of Yonkers, N. Y., died there of pneumonia, aged sixty-one years. He was born in Nottingham, England, in 1821, near the home of Lord Byron. He came to this country thirty-three years ago, and with the exception of one year, made Yonkers his home. The deceased studied pharmacy in England, and for a long period was connected with the London hospitals and Apothecaries' Hall. Mr. Toplis left a wife and one son aged four years, to mourn their loss. The deceased became a member of this Association in 1863, at the meeting held in Baltimore.

W. T. Bray, of Wingham, Canada, died there of congestion of the lungs, after a few days' sickness, in the thirty-fifth (35) year of his age. He was a son of the late W. Bray, a druggist of Petrolia. The deceased leaves a widow and two children, a son and an infant daughter. He was greatly beloved in Wingham, and took a deep interest in all local affairs, ever foremost in promoting the prosperity of the town. For a number of years he was a member of the school board, of the town council, and chairman of the infringement committee, a position which he filled with much ability and with marked success. In pharmaceutical matters he was deeply interested; and it always gave him pleasure to work for the advancement of pharmacy. Many times during his illness he spoke with regret at not being able to be present at the last meeting of our Association, a visit that had been anticipated with much pleasure by himself, and some of his Canadian friends. Mr. Bray connected himself with our Association at the Kansas City meeting, in 1881.

Stephen L. Talbot, a graduate of the Philadelphia College of Pharmacy of the class of 1880, died in Providence, R. I., on the 15th of January 1883. Mr. Talbot was a young phamacist of great promise. He was born in Dorchester, Mass., in 1853, and in early life showed indications of a love for study; having obtained a good education, he sought opportunities for entering upon the study of pharmacy, and coming to Philadelphia, obtained successively positions with Messrs. McKelway and Borell, R. F. Fairthorne, and Joseph P. Remington. He stood high in general scholarship amongst a long list of fellow graduates, and to him was awarded the first H. C. Lea prize for the best thesis. After graduating, he opened a pharmacy in Providence, where he resided, and carried his enterprise on to a successful issue, until the sudden summons called him Home. He died of typhoid fever, after a short illness of about two weeks. He was of a genial and kind disposition, and tenderly loved by his relatives and friends. He became a member of this Association at the meeting held at Niagara Falls, 1882.

William Moll died at Saginaw City, Mich., March 13, 1883, after a brief illness. He was born at Anspach, Bavaria, in 1829, and was therefore in his fifty-fourth year. Mr. Moll was educated in Germany, gave much attention to music, and after coming to this country, was for many years the only musician of any prominence in the locality where he resided. Mr. Moll first turned his attention to mercantile life, and entered the employ of Eaton & Blockmar. He continued with the business after it was purchased by D. H. Jerome & Co., in 1854. In 1858 he was elected clerk of the courts of the county in which he resided. In 1863, with a Mr. Smith, he formed a co-partnership in the drug business, which continued till 1870, when it was dissolved—Mr. Smith retiring, Mr. Moll remaining in the same store up to the time of his death. The deceased was a genial, whole-souled man, and enjoyed the regard and esteem of a large circle of friends. He leaves a wife and three children, two sons and a daughter. He united himself with this Association at the meeting held in Chicago, 1869.

Frank L. Vreeland, of San Francisco, died there early in the morning of the 11th of January, 1883. He was a graduate of the California College of Pharmacy, Class of 1879, and at the time of his death was the Curator and Librarian of the Pharmaceutical Society. Although a young man, and only a resident of San Francisco a few years, yet by his gentlemanly bearing, his courteous manners, and his intense zeal and interest in everything appertaining to pharmacy, he soon surrounded himself with a host of friends, and took rank among the prominent pharmacists of the city. He was entirely devoted to his profession, and when free from the cares of business, gave all his time to pharmaceutical investigations or literary labor. He originated the pharmaceutical department of the "Pacific Medical and Surgical Journal," frequently communicated with the Eastern press, and rarely failed to have a "paper" at the various meetings of the Pharmaceutical Society. In his death the Society loses one of its most active and zealous members, an original investigator and a devoted student. Mr. Vreeland was elected a member of this Association at Saratoga Springs, 1880.

Charles J. Powers, of Syracuse, N. Y., died April 2d, 1883, of cardiac neuralgia, in his thirty-fourth year. He was ill but a single day. Mr. Powers received a collegiate education, and afterwards engaged in the drug business. He was an enterprising, zealous druggist, popular with the public and true to a large number of friends. He was thoroughly upright in his business affairs, and was guided in every act by a keen sense of honor. He possessed laudable business ambitions, and was both vigilant and industrious. He was married about twelve years ago. Mrs. Powers and a son not yet two years old survive him. He was a member of the New York State Pharmaceutical Association, and became a member of our Association at the last meeting, held at Niagara Falls.

Charles Hodge, of Portland, Oregon, died at his residence of pneumonia, after a short illness, in his 55th year. He was born in Newburyport, Mass., in October, 1828, and at an early age he entered the retail drug store of his uncle in that city. He sailed for California, around Cape Horn, in 1849, arriving in San Francisco in 1850, and remained there about ten years in the retail drug business. In 1860, he came to Portland, and with Mr. Calef, started a wholesale and retail drug store on Front Street, under the name of Hodge and Calef. In 1866, the firm name was changed to Hodge, Calef & Co. Mr. Calef died in 1876, and the firm changed to Hodge, Snell & Co. In 1878, this firm and that of T. A. Davis & Co. were consolidated, and the new firm took the name of Hodge, Davis & Co. The deceased held several positions of public trust; he was twice elected a member of the school board, and at the time of his death was holding that position. He leaves a wife and one daughter. He was respected by all who knew him. He ceased to be a contributing member in 1881. His membership in this Association dates back since 1859, at the meeting held in Boston.

Edward H. Luckenbach, of Bethlehem, Pa., died there of paralysis in the thirty-fifth year of his age. Mr. Luckenbach was born in Bethlehem, March 18, 1849. After completing his education in the Moravian day-school, he entered the drug store of E. T. Myers, where he remained as clerk for several years. Later he went to Philadelphia, where he entered the drug store of Charles Ellis, Son & Co. About this time he attended a course of lectures in the Philadelphia College of Pharmacy, and graduated from that institution in March 1870. The same year he commenced business in his native town, and continued in the same place up to the time of his death. His early death will be regretted in a large circle of relatives and acquaintances. He leaves a wife and four children, two daughters and two sons; his mother also survives him. Deceased became a member of this Association at the meeting held in Baltimore 1870.

Mr. Lucian Harwood, of Warren, Mass., died there quite suddenly of heart disease. Mr. Harwood was born at Oxford, Mass , December 27, 1818, and at the time of his death was in his sixty-fith year. His father died when he was quite young, leaving a family of six boys of whom he was the eldest, which the mother succeeded in keeping together and bringing up creditably. Mr. Harwood came to Warren in 1842. He was a genial, pleasant man to meet, one who made friends wherever he went. Upright and honorable in business, he would suffer wrong rather than do wrong. Mr. Harwood leaves a widow and one son, who was associated with him in business. He became a member of the American Pharmaceutical Association at the meeting held in Boston, 1875.

Theodore Kalb died at St. Louis, October 26th, 1882, in the 56th year of his age. He was born in Berlin, Prussia, on the 8th day of March, 1826. He was educated in the city of Berlin, and emigrated to America in 1849. Shortly after his arrival in St. Louis, he commenced an apprenticeship to the drug business with Mr. Flacks, and in 1853 took charge of the store of Mr. Huckstedt, who had died in consequence of a fall from a roof. About twenty years ago, Mr. Kalb commenced to combine with his business the importation and sale of pure chemicals and chemical apparatus for analytical and college purposes, which branch, through his energy, became so extensive as to make it necessary to obtain a separate building on Market street, and to devote his whole time and attention to this new department, leaving the supervision of the Pharmaceutical branch to his partner. Mr. Kalb was one of the founders of the St. Louis College of Pharmacy, for a number of years a member of its Board of Trustees, and has always taken a deep interest in all matters concerning and elevating our profession. He was highly esteemed as a citizen, true to his friends, kind in disposition, courteous, prompt, and conscientious, possessing all qualities to ensure success in business. He leaves a wife, two sons, and one daughter. His membership in this Association dates back since the meeting held in Cincinnati, 1864.

Henry Kelsey, Jr., was born in New Haven, Conn., December 3, 1848, and died of peritonitis, in the same city, August 30, 1883. He learned the drug business wtih Chas. G. Pendleton, East Bridgeport, entering as an apprentice in 1864; afterward he clerked in New Hampshire and in Brooklyn, and in 1872 started in business for himself at the corner of Grove and Orange streets, New Haven. He had been married four years, but leaves no children. The deceased became a member of this Association in 1873.

Daniel B. Smith, an honorary member of this Association, died in Philadelphia at the ripe old age of ninety one years. Mr. Smith was born in the city of Philadelphia, Seventh month 14th, 1792. His father died when he was but one year old. He was educated at the school of John Griscom. In the fall of 1808, Mr. Griscom commenced a series of public lectures on chemistry, in a school-room in Burlington, and taught chemistry to his more advanced pupils, which was probably the first teaching of chemistry in the common schools in the State, and where Mr. Smith first began the study of chemistry. After leaving school, Mr. Smith entered the store of John Biddle, Market street, to learn the drug business. At the completion of his term of apprenticeship, he was taken into partnership under the firm name of Biddle & Smith. This partnership continued for about one year. In 1819, D. B. Smith withdrew from the partnership, and opened store on his individual account at the northeast corner of Sixth and Arch streets. As an index of his turn of mind, as a young man, we find him interested in the means of extending information and self-culture to boys who were learning trades. The result of this was the founding of the Apprentices' Library, in 1820. About this time, he labored incessantly for the establishment of a College of Pharmacy. The result of his labors was the adoption and signing of a Constitution, on the 3d of March, 1821, of a college especially intended for the instruction of druggists. The first meeting of "The College of Apothecaries" was held March 27, 1821, at which officers were elected, D. B. Smith being chosen Secretary. March 30, 1822, the institution was incorporated as the Philadelphia College of Pharmacy. Mr. Smith was a liberal contributor of original articles to the early volumes of the American Journal of Pharmacy, and furnished many valuable selections from foreign periodicals. His original article on Epsom Salt and Magnesia, opened the first number in December 1825. After service as Secretary for several years, he was elected Vice President in 1828, and President in 1829. For a period of twenty-five years he held this position, resigning in 1854. He contributed several articles for the first edition of the U. S. Dispensatory. He became a member of the Franklin Institute at the first meeting after its organization in 1824, and continued a member for fifty years. In 1829 he was elected a member of the American Philosophical Society. He was also a member of the Academy of Natural Sciences. In 1828, we find the name of D. B. Smith as one of the corporators of an institution which has been of lasting benefit to society—"The House of Refuge." In 1834, at the earnest solicitation of the Board of Managers of Haverford School (now Haverford College), he accepted the chair of Moral Philosophy, English Literature and Chemistry, and removed his residence to Haverford. In 1846, he resigned his position at Haverford, and returned to Philadelphia, and gave his attention to business at the corner of Sixth and Arch streets. He was President of the first meeting of our Association, held in Philadelphia in 1852, and was made an honorary member in 1856. Deceased was highly esteemed, respected, and loved by all his numerous acquaintances. His membership in this Association dates back to its organization.

In concluding this report, permit me to return thanks to all officers and members of the Association, who rendered me valuable assistance whenever needed.

Yours, etc., GEO. W. KENNEDY,
Chairman of Committee on Membership.

The President appointed the following committee on exhibits: Messrs. W. J. M. Gordon, of Cincinnati; J. A. Milburn, of Washington, D. C.; W. J. Jenks, of Philadelphia; N. Kuhn, of Omaha, Neb.; and Thomas Whitfield, of Chicago.

MR. EBERT: Mr. President, before we adjourn I think it is due to the council that they should receive the hearty thanks of this Association for the work they have performed for us during the last year. It is certain that they have done an enormous amount of work, for which they should receive recognition. If some of us had to do the labor that has been done, we should even better appreciate the result that has been reached. I therefore move that the thanks of this Association be extended to the Council.

Mr. Ebert's motion was adopted and the thanks of the Association tendered to the Council.

Mr. Diehl read the introductory portion of the report on the Progress of Pharmacy (see page 25), and the chairman of the Committee on Legislation, read the report of that committee (see page 315), both of which were adopted:

MR. MENNINGER: In connection with the proposed commission for the Army and Navy Stewards, I have received a communication from several stewards of the United States Navy, who are unable to be present, owing to their duty on board ships at stations, particularly requesting that resident pharmacists at Washington will interest themselves in their behalf, thinking that if there was somebody at headquarters to urge the matter before the next Congress, justice might be done to them. I once more call attention of the members to the fact that anything we do in this connection is really raising the dignity of the profession at large. In every instance where pharmacists are only recognized as quasi professional men, not actually so, we should attack and fight. As long as the pharmacists in the government service have not even the power of obtaining the rank of a master carpenter, it is a slur upon the entire profession. I hope that all the gentlemen within the sound of my voice who are acquainted with a member of Congress, will urge upon him the necessity of doing something for that portion of his constituency.

MR. EBERT.—I would like to say something in addition to the report, and that is that we make one serious mistake in framing laws for States, in recognizing diplomas—it has been the cause of defeating a number of enactments which otherwise would have been secured. The recognition of diplomas is a bar to legislation. My experience in 1870 in trying to effect legislation in the Illinois Legislature was defeat on that very ground. The committee who had it in their charge would not allow the recognition of medical diplomas, and the bill was defeated simply on that ground. Later on another bill was presented in the Illinois Legislature, and the same objection was made to it; the only way the bill was finally passed was by the insertion of a clause stating that the diploma of either a College of Pharmacy or a Medical College be made to stand as an equivalent for qualification.

Now last year I wished to have a change made by our Legislature, in our State law, that a diploma should not be recognized; and I personally have advocated that since 1870, for this reason, that our schools of pharmacy are teaching schools, and that they qualify young men for the practice of pharmacy. Now if these young men cannot stand the examination by the Board of Pharmacy, they certainly are not qualified to practice pharmacy; but if he does pass the Board, you may rest assured there will be no objection, and you will have no medical interference with the practice of pharmacy. That is the point we should observe in drafting bills in relation to pharmacy. You will be sure to carry the bill if you leave out the matter of diplomas. I do not see why our graduates in pharmacy, if they are properly qualified in our schools of pharmacy where they get their instruction and training, why they should not come before a Board of Pharmacists, who are composed usually of scientific men, and pass examination. I do not speak against schools of pharmacy, because I have always recognized their labor and their good work; but we want pharmacy laws to recognize *pharmacy*. If you oppose because your diploma is not recognized, you put an obstacle in the way of such an enactment.

On motion, the Association adjourned to meet on Wednesday morning at 9 o'clock.

Second Session.—Wednesday Morning, September 12, 1883.

President Heinitsh called the meeting to order, and the Permanent Secretary read the minutes of the first session, which were on motion approved. The Secretary of the Council read the minutes of that body, which were likewise approved. The minutes of the Council gave the following information:

The following candidates, reported to the Association at its first session, were elected:

Arkansas.

John B. Bond, Little Rock.
Robert Patterson Menard, Hot Springs.
John L. Zimmerman, Searcy.

Connecticut.

Frank M. Wilson, Willimantic.

Illinois.

Samuel G. Ade, Chicago.

Iowa.

Jacob H. Harrison, Davenport.

Kansas.

Geo. Frank Butler, Belle Plaine.
Bernard H. DeHuy, Abilene.

Louisiana.

J. B. Lavigne, New Orleans.
Ben Lewis, New Orleans.
John J. Mellor, New Orleans.

Maine

Mary Helen Morrell, Winterport.
Abel S. Sweet, jr., Bangor.

Maryland.

Chas. Caspari, jr., Baltimore.
David M. R. Culbreth, Baltimore.

Massachusetts.

John L. Buck, Chelsea
Lowell Appleton Drown, Taunton.

Mississippi.

Joseph William Eckford, Aberdeen.

Nebraska.

Frank W. Kennard, Omaha.

New Jersey.

George R. Davis, East Orange.
Abram Musler, Orange.

North Carolina.

Eugene Francis Hatch, Goldsboro.

New York.

Henry Maclagan, New York.
J. Hungerford Smith, Au Sable Forks.
John Wackerbarth, Brooklyn.
Leonard H. Wheeler, Albany.

Ohio.

William Hauenstein, Bluffton.
Otto L. Hoffman, Columbus.

Pennsylvania.

Clifton H. Beach, Pittsburg.
George Bochert, McKeesport.
Edwin G. Eckert, Hanover.
Frank B. Fleming, Shippensburg.
Frederick Nick, Erie.
William W. Nisbet, Pittsburg.
Joseph Rieseman, Liberty.
Andrew J. Snively, Hanover.
George M. Thomas, Derry Station.

Rhode Island.

Henry J. Alfreds, Providence.
William R. Greene, Providence.
H. J. Leith, Providence.

South Carolina.

George Ludwig Marsteller, Charleston.

Virginia.

Edward C. Jackson, Norfolk.

Quebec, Canada.

Richard Wellington Williams, Three Rivers.

Applications for membership were examined, and ordered to be reported to the Association. The Treasurer's report was read, and referred to the Finance Committee to be audited.

Mr. Tufts read the following report of the Nominating Committee:

The Nominating Committee respectfully report the following nominations:

For President—William S. Thompson, Washington, D. C.

For First Vice-President—Charles Rice, New York.

For Second Vice-President—Frederick H. Masi, Norfolk, Va.

For Third Vice-President—Edward W. Runyon, San Francisco.

For Treasurer—Charles A. Tufts, Dover, N. H.

For Permanent Secretary—John M. Maisch, Philadelphia.

For Reporter on Progress of Pharmacy—C. Lewis Diehl, Louisville.

For Members of Council (Term expires 1886)—Joseph P. Remington, Philadelphia; George W. Kennedy, Pottsville, Pa.; Henry J. Menninger, Brooklyn, N. Y. To fill the unexpired term in case Mr. Thompson is elected President (term expiring 1885)—Albert E. Ebert, Chicago.

For Committee on Drug Market—William A. Gellatly, New York (*Chairman*) E.; Waldo Cutler, Boston; Mahlon N. Kline, Philadelphia; Daniel Myers, Cleveland, O.; William Simpson, Raleigh, N. C.

For Committee on Papers and Queries—John U. Lloyd, Cincinnati (*Chairman*); George W. Sloan, Indianapolis; William W. Bartlet, Boston.

For Committee on Prize Essays—C. Lewis Diehl, Louisville (*Chairman*); Adolph W. Miller, Philadelphia; Emil Scheffer, Louisville.

For Committee on Legislation—John M. Maisch, Philadelphia (*Chairman*); Samuel A. D. Sheppard, Boston; Edmund Bocking, Wheeling, W. Va.

(Signed,) CHARLES A. TUFTS, *Chairman.*

The report was received and a ballot was ordered to be taken for President, the Chair appointing as tellers Messrs. Brown, of Camden, N. J., and De Forest, of Brooklyn, to conduct the election, which resulted unanimously in favor of Mr. William S. Thompson as President for the ensuing year.

On motion of Mr. Remington, a ballot was ordered for the remaining officers and committees nominated. On examining the ballots, the tellers reported that one black ball had been deposited. It being stated that this had probably been done by mistake, on motion of Mr. Milburn a second ballot was taken, and this resulted in the unanimous election of all the nominees.

The Chair appointed ex-Presidents Gordon and Shinn a committee to conduct the executive officers elect to the chair. The newly-elected President and First Vice-President being present, they were conducted to the platform, the Association rising.

PRESIDENT HEINITSH.—Mr. Thompson: I congratulate you, sir, on your exaltation to the highest office in the gift of this Association, and I cheerfully present to you the badge of your office, the constitution and by-laws of this Association, and the pestle of the presiding officer, being assured they will be safe in your custody; and I wish you a pleasant and prosperous term of office. (Turning to the Association.)

Gentlemen, I introduce to you Mr. Thompson, the newly elected president, a member whom you have known long and well, and who will serve you faithfully now, no doubt, in the prominent office to which you have elected him. I bespeak for him that courteous assistance that you have so cheerfully rendered to his predecessors. (Applause.)

MR. THOMPSON, the newly-elected President.—Fellow members of the American Pharmaceutical Association: On behalf of my brethren of Washington, I beg leave to acknowledge the compliment you have paid this city by selecting your presiding officer from amongst us; on my own part, as the recipient of this distinguished honor, I extend to you my most heartfelt and sincere thanks for this very flattering manifestation of your confidence and high regard. Having voluntarily placed me in this high position, I feel on this account, if I was not assured on any other, that I will be able at all times to confidently rely on your assistance in conducting the affairs of the Association; and I beg leave further also to state that I may have frequent occasions to claim your indulgence for my deficiencies. Again, gentlemen, I thank you. (Applause).

PRESIDENT HEINITSH.—I now introduce to you, gentlemen, the first Vice President, Charles Rice.

CHARLES RICE.—Gentlemen: I thank you for the great honor which you have bestowed upon me in electing me to this important office, second to that of the President. I am well known as being unable to make a speech; I shall endeavor to make up for my shortcoming in that respect by any work that I can do for the Association, or any help I can give to the students in our colleges, or to our friends who are laboring for the cause of pharmacy in general. I thank you, gentlemen, for the honor you have bestowed upon me. (Applause.)

President Thompson occupied the Chair.

MR. MENNINGER:—We have as large an attendance here as we are likely to have in the course of the morning. I have consulted with some of the gentlemen of the Council, and with the officers and some members; and as a result of the consultation, I move that this Association hold a session at 3 o'clock this afternoon, in this room. This is a little different from the course prescribed on the programme of the Committee of Entertainment; but of course the dog wags the tail, and not the tail the dog. We have a very unpleasant day without, and there being no chance for an entertainment, I think that we can have a very interesting meeting here this afternoon.

MR. REMINGTON:—I second the motion of Mr. Menninger. A communication has been received from the Chairman of the Entertainment Committee, who is not well to-day; on account of the great inclemency of the weather, it has been suggested that the ride to the Soldiers' Home this afternoon be indefinitely postponed. There is a great deal of important business before the Association, and I suppose that we all know that the report of the Entertainment Committee, as published in the pharmaceutical journals before the meeting of this Association, was merely of a suggestive character, and that the Entertainment Committee has no power whatever to fix the time of the sessions or the adjournments of the Association—that power being alone vested in the Association. We have the right, if we choose, to stay all day and all night; and it is only for the convenience of the members that the programme of the Entertainment Committee is published. However, at this time, it is at the request of the Chairman of the Committee on Entertainment that this change is suggested to be made; and, therefore, I second the motion of Mr. Menninger, that we have a session of the Association this afternoon at 3 o'clock.

Mr. Menninger's motion to hold an afternoon session at three o'clock was adopted, after which the Secretary of Council read the names of twenty-two candidates, whose applications for membership had been scrutinized by the Council.

The Treasurer then read his annual report as follows:

TO THE OFFICERS AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

GENTLEMEN: Time in its rapid flight has again brought us to the threshold of another meeting. With grateful hearts we again cordially greet each other, and warmly grasp each other's hand. Again we meet for our mutual good, and to increase the usefulness of our Association. That you may learn of our financial prosperity, I herewith present the annual report.

All the bills of which I have any knowledge have been paid, and there is a balance in the treasury of $4196.58. In addition the association has the Ebert Fund $682.43, the Centennial Fund $1232.76, and the Life Membership Fund $904.38. The total of these funds is $2829.57, and by vote of the Association they are invested in four per cent. United States registered Government Bonds. The increase of our funds is due to the action of the Association requiring the amount for membership to accompany the application, commencing our financial year in January, thus enabling the Treasurer to send out the bills earlier in the year, and to more persistent effort in collecting the bills. The Treasurer has great pleasure in reporting the prosperous condition of the Association, and can see no reason why it should not continue so.

There are now 1383 names on the roll of members. I have information of the decease of eighteen members since our last meeting, eight have resigned their membership, and fifty-two are liable to be deposed from the roll for non-payment of dues. Agreeably to my duty, I have given the names to the Secretary of the Council. I hope to have the pleasure of reducing this list.

In 1868 the finances of the Association were so much reduced, that the Treasurer advanced a small amount to enable him to report the bills of the Association as paid to date. The Association voted to request any members who would so do, to donate each the sum of two dollars to the Association, and a majority of the members at that time cheerfully responded to the request. From time to time other members, especially the old life members, have donated small sums to the Association. I am unable at this time to report the amount donated to the Association, but have thought it might be well for the Association to request the Treasurer to ascertain from the books the total amount thus donated, and to withdraw that amount from the treasury, and add the same to one of the funds of the Association.

A few certificates from extinct members have been returned to me. I regret that any ex-member should neglect to fulfil the promise he made when he became a member of the Association.

A severe accident disturbed my correspondence during the year. I hope, if life is spared, to be more prompt during the coming year. I gratefully acknowledge my pleasant intercourse with *all* the members of the Association since our last meeting, and with the kindest wishes for you all, I close my report.

CHARLES A. TUFTS, *Treasurer.*

Receipts and Disbursements of the American Pharmaceutical Association for the Year Ending September 3, 1883.

1883.	RECEIPTS.	
Sept. 3.	To Balance on hand Sept. 1, 1882.	$1981 10
	To Amount received for yearly contributions for 1879 . .	90 00
	“ “ “ 1880 . .	290 00
	“ “ “ 1881 . .	1435 00
	“ “ “ 1882 . .	3050 00
	“ “ “ 1883 . .	1385 00
	“ “ memberships	600 00
	“ received from the sale of Certificates	295 00
	“ “ “ Proceedings. . . .	81 50
	“ received for Life Memberships.	150 00
	“ received from the friends of Geo. W. Andrews.	100 00
	“ “ the sale of badges	20 00
	“ “ interest account	78 15
		$9555 75

1883.	DISPURSEMENTS.		
Sept. 3.	By Cash paid for the Proceedings:		
	Sherman & Co., printing.	$1885 64	
	William Rutter & Co., binding	334 58	
	Cyrus R. Morgan, phon. reporter	100 00	
	F. Gutekunst, photographs.	81 50	
	William M. Clark, engravings.	46 00	
	C. Lewis Diehl, salary as reporter on the Progress of Pharmacy from Sept. 1, 1882, to Sept. 1, 1883. . . .	500 00	
			$2947 72

By John M. Maisch, salary from Sept. 1, 1882, to Sept. 1, 1883	$600 00	
By miscellaneous expenses, including expenses attending the annual meeting at Niagara Falls, printing, stationery, postage, expressage, freight, and packing boxes	349 88	949 88
By Charles A. Tufts, salary from Sept. 1, 1882, to Sept. 1, 1883	$500 00	
By miscellaneous expenses, including expenses attending the annual meeting at Niagara Falls, printing, stationery, postage, expressage, filling out certificates, and the expenses of agents in cities	264 14	764 14
By George W. Kennedy, salary as Secretary of the Council in 1881–1882	$100 00	
By miscellaneous expenses, including printing and postage.	101 50	200 50
By Samuel A. D. Sheppard, expenses of the California Committee.	$62 70	
By Samuel A. D. Sheppard, expenses of the Finance Committee	68 73	
By Samuel A. D. Sheppard, expenses as agent	6 00	137 43
By insurance of the property of the Association stored at the Philadelphia College of Pharmacy.		15 00
By American Bank Note Co., printing certificates		47 00
By cash paid Ebert fund.		128 00
" Life Membership fund.		150 00
" returned to the friends of George W. Andrews		18 50
		$5359 17
Balance to new account		4196 58
		$9555 75

MR. REMINGTON.—This report was read and received the attention of the members of the Council. It properly comes up under the by-laws for action by the Council, and a committee has been appointed to go over it; but it was felt that the report ought to be read here in the open session of the Association, in order that the members present could hear from the lips of the Treasurer himself in what an excellent condition the Association is financially. There is no doubt, with the cash on hand, a fund of over $7,000 which is in the hands of this Association, that we are financially in good standing. When we reflect that only fifteen years ago the members had to be called upon for an extra assessment of $2.00 to help the Association out, we have great cause to congratulate ourselves that in this short time our affairs have become so flourishing financially.

MR. SHINN, of Philadelphia.—I would ask if the Council have the power to carry out the suggestions made by the Treasurer, without action by this Association?

THE PRESIDENT.—No, sir.

MR. SHINN.—The Treasurer states as a suggestion that the sums donated be taken from the general fund and appropriated for a specific purpose.

MR. TUFTS, the Treasurer.—Added to one of the funds.

MR. SHINN.—If it is necessary to have the approval of the Association, I move that that be referred to the Council for action.

MR. EBERT.—Does not the Treasurer ask the Association to request him to make up that amount—first? then it would be proper that it should be referred to the Council. The Council cannot do anything until the Treasurer has made out that report. I hope if there is any large amount it will not go to any special fund. Our funds don't seem to be very valuable. If we are going to lay up money for years to come, the result will be that we will become very rich by the time we are all dead. I hope the money will be used before that time. My objection to its being referred to the Council at this time is, that the report stating the full amount has not yet been made. That will be done next year, and then we may have it referred. I think that is the idea of Mr. Tufts.

MR. TUFTS.—That is my idea.

MR. SHINN.—I will accept that as an amendment.

THE PRESIDENT.—The motion as amended is that the Treasurer be requested to report next year to the Association the sum of the donations made by the members.

The motion as amended was adopted.

The reading of reports being in order, Mr. Kennedy read that of the Council Committee on Membership (see page 426), and Mr. Diehl that of the Standing Committee on Prize Essays, which is as follows:

TO THE AMERICAN PHARMACEUTICAL ASSOCIATION:

Gentlemen: Your Committee on Prize Essays have the honor to report that, having carefully reviewed the papers read before the Thirtieth Annual Meeting, they recommend that the Ebert Prize for 1882 be awarded to Professor J. U. Lloyd, for the lucid explanation and practical illustration of the formation of precipitates in fluid extract.

Respectfully submitted, C. LEWIS DIEHL, *Chairman*,
E. SCHEFFER.

The report was accepted, and the recommendation adopted.

Mr. P. Roberts Baker read the following report:

The Special Committee appointed at the meeting of the Association in 1882, to consider the expediency of holding a meeting of the Association in California at some time within the next three years, have attended to their duty, and respectfully report as follows:

To each member of the Association in the United States, except to the members on the Pacific coast, a circular was sent stating the purpose for which this Special Committee was appointed, the desirability of holding such a meeting, the probable cost to the Association, and the extreme limit of needful expense to each member attending from the East.

With this circular was enclosed an addressed postal card, on which two questions were printed, as follows:

Do you think that the American Pharmaceutical Association should hold a meeting in California?

Should a meeting be held there, would you probably attend?

Copies of the circular and postal card accompany this report.

To every druggist and pharmacist on the Pacific coast another circular was sent, explaining the subject quite thoroughly.

The main object of this circular was to ascertain if the men on the Pacific coast are sufficiently interested in the Association to warrant the holding of a meeting in California.

With this circular was enclosed an addressed postal card, on which seven questions were printed, as follows:

1. Would you like to have a meeting of the American Pharmaceutical Association held in California?
2. Should such a meeting be held, will you attend?
3. Will you contribute a paper to be read at the meeting?
4. What would be the prospects for an exhibition?
5. How many do you anticipate would attend from your section?
6. Where should such a meeting be held?
7. At what season of the year should it be held?

Copies of the circular and postal card accompany this report.

Nearly 1400 of the first circulars and postals were sent out. Of these only 643 postal cards were returned to the committee, something over 700 of the members to whom they were sent, being either careless or so indifferent to the matter as not to take the trouble to write yes or no, signing their name and dropping the card in the post-office.

The replies received may be summarized as follows:

Approvals	295
Disapprovals	348
Probable Attendance	88
Doubtful Attendance	84
Will not Attend	471

Of the 440 postal cards sent with circulars to the druggists and pharmacists on the Pacific coast, but 49 were received back by the committee, they being 40 from California, 8 from Oregon, and 1 from Washington Territory—thus showing that about 90 per cent. were indifferent to the matter.

The replies received on these 49 postals may be summarized as follows:

To the *first* question—

34 answer yes.
3 answer no, one of them giving at length the reasons for his negative answer.
12 express themselves as indifferent to the matter, or do not reply.

To the *second* question—

28 answer yes.
4 answer no.
12 answer that perhaps they may.
3 do not reply.

To the *third* question—

8 answer yes.
30 answer no.
1 answers possibly.
10 do not reply.

To the *fourth* question—

27 answer good.
11 answer poor.
11 do not reply.

To the *fifth* question—

Total *estimate*, about 125 to 150.

To the *sixth* question—

34 answer San Francisco.
3 answer Sacramento.
3 answer Oakland.
2 answer Los Angeles.
1 answers Stockton.
1 answers in a fort.
5 do not reply.

To the *seventh* question—

1 answers February.
3 answer the Spring.
2 answer May or June.
1 answers May or October.
2 answer June.
4 answer the summer.
1 answers August.
1 answers August or September.
9 answer September.
1 answers September to February.

5 answer October.
7 answer the Fall.
1 answers the Fall or Winter.
1 answers at Christmas.
1 answers November.
7 do not reply.

Of the 34 affirmative answers to the first question, only one seems at all enthusiastic.

Your Committee feel that by the means they have thus adopted, they are enabled to form a fair judgment as to the desirability of holding a meeting of the Association in California within the next three years, and their unanimous opinion is that *it is* NOT *desirable to do so.*

The reasons for this decision may be summed up in the two following statements:

First. It is probable that the attendance of members from the East would be quite limited.

Second. While there are a few on the Pacific coast who have a lively interest in the Association, there do not seem to be enough of such interested workers there as would warrant holding a meeting there just at present, with a good prospect that said meeting would be a success. Signed,

S. A. D. SHEPPARD,
T. ROBERTS BAKER,
JOS. S. EVANS.

Mr. Baker also read the following letter:

SAN FRANCISCO, AUGUST 8, 1883.

S. A. D. Sheppard, Esq., Boston.

DEAR SIR.—Your letter of June 30th, to Prof. Emlen Painter, has been placed in my hands to answer. You will, I am sure, learn with sincere regret that his health, which at first seemed to have been entirely restored by his recent visit East, has again failed him to such an extent that he has concluded to leave California permanently. By the time this reaches you, he will probably be on his way. We hope he will soon regain his wonted health and vigor, in which case our eastern friends, who have so many active coadjutors in the cause of pharmacy, will gain at the expense of the Pacific, where disinterested and able workers are so scarce.

A few days after Prof. Painter's arrival, a number of his friends tendered him a reception, at which many members of the College and Pharmaceutical Society were present—about thirty-five in number. As it seldom happens that so large a number get together, Prof. Painter thought it a good time to present the matter of the proposed meeting in California of the American Pharmaceutical Association. Your letter was read, and called forth a *unanimous* expression of the desire that the Association should come here in 1884, or as soon thereafter as they might deem practicable.

When I tell you that of all the persons present on the occasion referred to, only ONE had either seen or heard of the postal cards you sent out, you can imagine the astonishment that your letter produced. The gentleman who had received one, was a resident of Oakland, in the next county to this; and we have no doubt at all that by some oversight in the mailing, San Francisco was left out altogether. Would it not be well to remedy this omission even now, and after you have received replies, to reconstruct your tables? I am sure there would be a marked change in the figures.

Some surprise was also expressed that you could find so large a number as 440 "druggists and pharmacists" on the Pacific coast; but when we called to mind that quite a number of store-keepers are called "druggists" because they sell "groceries, drugs, dry-goods, hardware, and other sweetmeats," we thought we got a little light on the whole subject. We do not believe that the pharmacists are so indifferent on the subject as they appeared to you to be. Some may doubt our ability to entertain the Association to your satisfaction and our own credit, and may feel that by inviting you here we are only asking you to come and see the poverty of the land in pharmaceutical matters, but we believe you would receive on all sides a most cordial welcome, and that every effort would be put forth to render your visit one of pleasure and profit.

In looking over the forty nine answers received from California, I was gratified to find so good a proportion of favorable replies. For only three of these to negative the proposition seems to me quite encouraging, while the promise of a paper from eight outside of San Francisco is far beyond any expectations I should have indulged. Then again, an attendance of 150 outside of this city would be to my mind most gratifying. Indeed, I should not have expected so many, *had they not themselves* given the estimates.

In view, therefore, of all the circumstances here laid before you, I beg leave to request that your Committee will not report adversely to the claims of California for an early meeting of the American Pharmaceutical Association; and in doing so I am only carrying out the unanimous wish of the friends present at the reception given to Mr. Painter, amid whom were many of the most active pharmacists of this city.

I am, dear sir, yours very truly, W. M. SEARBY.

MR. EMLEN PAINTER.—Mr. President: I do not wish to take exception to what the Committee did, for they have certainly exerted themselves to find out the true wish of the Association about meeting in San Francisco; but for some reason not accounted for, or unaccountable to me, in sending those notices to California and to the Pacific Coast, as was stated by Prof. Searby in his letter, not one was received by the pharmacists in San Francisco. These are the men who have been active in pharmaceutical matters, and the California members of this Association reside almost entirely in San Francisco; therefore that report does not give the expression of California. Over four hundred postal cards were sent to the Pacific Coast, but those pharmacists, so styled, were not the pharmacists of the Coast, many of them being store-keepers; the most able pharmacists of the Coast, and those who take an interest in pharmacy, do not reside in the country towns or in mining camps. Drugs there are sold by the store-keepers, and these are called druggists, or are often styled "doctors" in that locality. If we are to have eight papers from members outside of San Francisco, the San Francisco members will add to that number; because their unanimous opinion, as shown by what took place at the meeting, where we had an unusually large representation both of the wholesale and the retail trade, is that the meeting would be a successful one. The Association would be very gladly entertained by the pharmacists of San Francisco and of the whole Pacific coast, notwithstanding the small number of replies—only forty-nine, I think, out of four hundred and fifty—which apparently shows a great indifference on the part of the pharmacists there. But the replies do show that any season of the year the Association would be safe in selecting as the time for their visit. The probable cost is the great bugbear in this matter. The cost of going West is great, but the Committee made it greater, much greater than it really is. I have traveled over the route several times, and I know the cost. The Knights Templar made a visit to San Francisco this year at a cost of $300.00. $350.00 would be the outside cost to the pharmacists, instead of $500.00, as the Committee set forth.

MR. REMINGTON.—There and back?

MR. PAINTER.—There and back, and to remain at least three weeks from home. Then the time is another item mentioned in this discussion. It was said that it would take a month to go to San Francisco and back, and we could go to Chicago and back in a week. The time occupied on the journey is now six days either way; next year they expect to get the time reduced to four days and a half either way, making nine days, and this is not a week longer than the time occupied in visiting other places in the United States. As to the cost being from $400.00 to $500.00, that is a very important point. The cost will not exceed $350.00. I was talking to one of the railroad officials, the Superintendent of the Chicago and Rock Island Road, and he gave me many points of interest; and he said that $350.00 at the present rate of travel was a very liberal allowance for an organization that would send out 150 members. For $350.00 they could spend from twenty-one to twenty-five days, and that would include a visit to the places of interest around, not far distant from San Francisco—but would not include a trip to the Yosemite Valley, as the trip to the Yosemite Valley and back costs from $40.00 to $50.00 for the railroad and stage fare; but there are hundred of other places of interest which would enable the members to be gone from home three weeks. They would see the country between here and there, and many places of interest in the vicinity of San Francisco. But the members talking about visiting San Francisco, say they could not go so far west as California without being at a very great expense, because they want to visit Los Angeles, and they want to go to Mexico, and they want to see the Yosemite, and visit the whole United States in one trip—all at the expense of the trip to California! —I don't think that is fair. [Applause.]

I might now read a dispatch that I received this morning from San Francisco, Cal. "The pharmacists still await, with eager anticipation, the visit of the American Pharmaceutical Association to the Golden gate. RUNYAN AND CALVERT."

MR. BAKER.—Mr. President, I presume that Prof. Painter, in making his estimate, speaks only of the actual cost of transportation and the actual expenses that might be anticipated; but my own experience has proved to me that when I am going to take a long trip, if I will just make out a little memorandum of the actual cost of transportation and the hotel expenses, and then just double that amount, before I get back I shall find that I have but very little money in my pocket. That is my experience.

MR. PAINTER.—I say, Mr. President, it is not simply the transportation and hotel expenses, but the probable whole cost to an individual. Mr. Baker must recollect that in travelling a long distance, the greater part of the expense is on account of the railroad fare, and the accommodations going there and back again. In going that distance the Pullman car accommodations are taken into consideration, which is one of the great items of expense, and the greatest reduction that can be had in that is one-fourth of the regular rates—I fear that a much greater reduction than that cannot be had.

MR. SHINN.—I think it is undoubtedly the case that the best pharmacists of California would be glad to receive the Association there. I think a good reason for adopting the report of the committee now, is the reply from the eastern pharmacists -very few of them expressing their willingness to go at present. After the three or four transcontinental roads are in full operation, and cutting each other's rates as much as possible, the expense will be lessened; and perhaps the business of the members of the Association in two or three years will improve, so they can better afford to go. For that reason I heartily second the motion of Mr. Ebert to adopt the report of the committee for this year, hoping that in two or three years there may be another phase of the subject presented.

MR. HOLMES.—I wish to take exception to the statement that a large part of the drugs of California or the Pacific coast are sold by storekeepers, That being the case, sir, it is a very sad commentary upon the California pharmacy law. It may be true in California—as to that I am not acquainted; but in Oregon and Washington Territory I am personally acquainted with nearly all the druggists, and I am free to say that the drugs there are not sold by the store-keeper. They are sold by graduates of the Philadelphia and other Colleges of Pharmacy, and in Washington Territory drugs are sold by graduates from the California College; also in my own town, as Professor Painter knows, there is as high a standard of pharmacists as in any town in the East of the same size. I believe, while it may not be expedient to go to San Francisco next year, it would be well to continue this committee, and to add to it some members from the Pacific Coast who are acquainted there, and who will use their further personal efforts to secure an attendance. I am free to say that the increase of membership would be large. I can promise you that nearly every druggist of Eastern Washington would join, and I think that you would gain largely in Oregon, and I am sure you would gain largely in California. I can promise you in San Francisco as large or larger an attendance than you have here. The expense may be a trifle more, but certainly in thirty-one years you can afford to give the pharmacists of the Pacific coast the benefit, instead of requiring them to be at the expense of visiting you every time. It is clear that every one wants to see the Pacific coast. We can show you some things there that you have not here; and, while I would recommend the adoption of the report, I should think it would be wise to continue the committee, with further additions, and I make this as an amendment to the pending motion.

The amendment was seconded.

The President.—The pending motion is that the report of the committee on the meeting in California be adopted; it is moved to amend the motion by adding to the committee, and that the report be received and the committee continued.

Mr. Ebert.—I will accept the amendment, and make the suggestion that the addition to the committee be a member from San Francisco or from the Pacific coast.

Mr. Remington.—You had better say two members.

The Secretary.—I would suggest two members, one from California, and one from Oregon or Washington Territory.

Mr. Ebert.—I accept the amendment.

Mr. Holmes.—I suggest that to your committee two members be added from the Pacific coast.

The President.—The motion stands then, that the report of the committee be received, and the committee continued, with the addition of two members from the Pacific coast.

Mr. Ebert.—Do I understand that the committee recommend a meeting in California in 1885?

Mr. Painter.—The report of the committee is that the Association is recommended not to meet there for several years. Talking with a great many members, many of them seem to be ready for a meeting there in 1885; but the committee recommends that it should not meet there then.

Mr. Baker.—I believe the report winds up by saying that there are few on the Pacific coast who have a lively interest in the Association, and that there do not seem to be enough interested workers there to warrant the holding of the meeting there just at present with a good prospect that the meeting will be a success. No particular time is recommended.

After some further discussion, the amended motion was withdrawn, and Mr. Ebert moved that the report be accepted, and the Committee discharged. This was adopted, and a motion was made by Mr. Holmes, of Washington Territory, that a new Committee be appointed to report at the next meeting as to the feasibility of holding a meeting in San Francisco, or on the Pacific coast. This motion was likewise adopted.

The Permanent Secretary now read a letter from the Orleans Pharmaceutical Association, inviting the Association to hold a meeting in the City of New Orleans, in the year 1885. The invitation was accepted, on motion of Mr. Menninger, and directed to be referred to the Committee on the time and place of the next annual meeting, to be hereafter appointed. On motion of Mr. Shinn, the thanks of the Association were returned to the pharmacists of New Orleans for their very kind invitation.

The report of the Committee appointed to visit the Western Wholesale Druggists' Association was called up.

MR. GORDON.—Mr. President, I have made no formal written report as to what that Committee did, as there was no business specially intrusted to them from that organization. Three members of the Committee, myself being one of those members, were present. We presented to that meeting the cordial greeting of this Association, and we were very cordially received, and responses were made by several members of the Association to what I had to say. I think that the advantage of this intercourse will be very material to both the organizations in the future. In am very glad to report that there was so much cordiality of feeling exhibited as there was. I don't know that there is anything special that I have to say further than this in relation to it. As I said before, there was nothing special intrusted to me to report to this Association.

Mr. Sloan read the report of the Committee on the Drug Market, which was accepted and referred for publication.

The President appointed Messrs. Shinn, of Pennsylvania; Ingalls, of Georgia; and Ebert, of Illinois, a Committee to consider and report on the time and place of the next annual meeting.

On motion of the Chairman of Council, the Association visited the exhibition room, and then adjourned to meet again in the afternoon at 3 o'clock.

THIRD SESSION.—WEDNESDAY AFTERNOON, SEPTEMBER 13.

President Thompson called the Association to order at 3.30 p. m. The Secretary read the minutes of the second session, and they were approved.

MR. COLCORD.—I would like to offer a motion similar to the one adopted by our State Association last spring; one that concerns this Association more than any other one in the country. The motion is as follows:

Resolved, That the committee on legislation be instructed to ask an appropriation of $25,000 from the general government, at the next session of Congress, to be expended under the direction of the Commissioner of Agriculture for the introduction and cultivation of foreign medicinal plants, and for the better protection of our indigenous plants.

I had some correspondence with Dr. Loring on this point, and he is heartily in favor of the movement, and thinks that such an appropriation can be obtained, and that it will be of special benefit to each one of us as pharmacists. Experiments can be made throughout the country. I think many pharmacists residing in the different sections of our country—a country of so vast extent—can assist in the introduction of almost all of the medicinal plants of the globe; and I hope the Association will adopt this resolution.

MR. EBERT. - I don't know that this Association ought to have much to do with this matter of asking money from Congress. We might want something at some future day, and we would not get it. I would ask whether Dr. Loring has made this request of us.

MR. COLCORD.—I stated that this resolution was adopted by our State Association, and it was recommended that a similar resolution be passed by this Association to the same effect. Since then I have received a letter, in which Dr. Loring said it was a good idea to ask the Association at the next meeting to pass this resolution. It was an object which would be of great benefit to the country and of benefit to us. He states that many of our indigenous plants are becoming scarce, and some will become extinct soon unless some means are taken for their protection, as is being done by the British government in their colonies, and also in England. This is acknowledged by them to be one of the greatest benefits they have ever received.

MR. EBERT.—Mr. William Saunders and myself have had the pleasure of visiting the Agricultural Department and the propagating houses, and of meeting the Superintendent, whose name is also William Saunders; he showed us the work they are doing. He spoke about the deficiency of funds. He did not express himself as very enthusiastic in regard to the medicinal plants, and he did not seem to lay any stress upon it. He said that the trouble was that that class of plants had very little attention given to them, that they were neglected. Seemingly what there was, was more for ornamental and for economical purposes. He did not at all seem to feel enough interest in this matter to say that he thought a money appropriation would be of any advantage. I do not wish at all to stand in the way, or seem to make any argument against getting some money out of Uncle Sam, provided it is going to do some good; but will it be properly appropriated? They have made a great many experiments in the Agricultural Department, and a great deal of flourish has been made, but very little accomplished. The former commissioner, Le Duc, travelled over the country from one end to the other, trying to raise sugar out of every vegetable and weed in the country, and a large amount of money was squandered. Associations like this are very apt to help the hobby of some man, and afterwards find it to be a great mistake. If Dr. Loring has asked us to aid him in this work, and really feels interested himself in it, and if it is not for some other hobby that Dr. Loring has, I would not hesitate one moment in saying it is a good thing. I do hope we will not ask favors when we really are not going to be benefited by them.

MR. MENNINGER.—I move that this subject be referred to the Council with power. Mr. President, I desire to say in explanation of my motion, that it has been made in order that some investigations may be had by this Association, or its officers, into the manner of the expenditure for purposes of this kind. I am aware that Congress has from time to time made appropriations for the introduction of foreign medicinal plants. I am also aware that these efforts have been crowned with very little success. This may be a particularly promising case, but I think it would be well, before the Association commits itself, to have the matter looked into by its own officers.

The motion of Mr. Menninger, to refer the matter to the Council with power, was duly seconded and adopted.

Professor Prescott read a paper in answer to query 16, On the Quality of Commercial Iodide of Potassium (see page 367). Vice President Rice in the Chair.

Mr. Remington.—Mr. President: It occurred to me while Professor Prescott was reading this paper, that the object of the manufacturers in sending iodide of potassium which contains a little alkali, is very evident. Professor Prescott has stated that if iodide of potassium is kept perfectly dry and well protected, the neutral salt will not become discolored; but I think that where potassium carbonate and potassium chloride are present, the tendency is to attract moisture; and that it is difficult, even with the pharmacopœial allowances of chloride and carbonate, to retain it in that dry condition; but if it is not kept dry, it will certainly become discolored upon keeping; and the manufacturers prefer to have the iodide slightly alkaline, because they can always send that out white, and they will have no complaint from their customers, who would return the article if slightly discolored. I think the pharmacists ought to be educated to believe that the iodide of potassium, if slightly discolored, but free from alkalinity, is better as an iodide of potassium to use, than one which is perfectly white and shows an excess of alkali. There is unquestionably, in the practical use of iodide of potassium in prescriptions, very frequently a difficulty met with. We find that we will get precipitates which are entirely due to the presence of this free alkali. I am very glad that Professor Prescott called attention to the fact, as the principal objection to the iodide of potassium is that it contains an alkali. Practically and medicinally, the amount of alkali shown to be present was not sufficient to make a particle of difference.

Mr. Vogeler.—I would like to ask if its presence is objectionable? The conclusion is that coloration is due to free iodine.

Mr. Remington.—I was speaking within the limits allowed by the Pharmacopœia. A slight discoloration might be found when the iodide of potassium was sent out perfectly neutral. The amount of discoloration that would come from that cause, I do not think would be subject to objection.

Mr. Markoe.—There is one difficulty which gives a great deal of trouble in our section. Many physicians are in the habit of prescribing iodide of potassium in combination with the syrup of iodide of iron. I scarcely know of a more delicate practical reagent than that. The least trace of alkali will decompose the ferrous iodide and make a colored preparation. With us an alkaline iodide of potassium is exceedingly annoying for that reason.

Mr. Vogeler.—I heard it stated a few years ago that the practice was to leave it in that state, in order to produce finer crystals.

Mr. Remington.—That is true.

Mr. Vogeler.—I wish to enquire about the granulated salt. I have been told by agents who praised such points, that it is really less contaminated with alkali than the crystals are. I would like to hear the experience of others in that respect.

VICE PRESIDENT RICE.—If I understand Mr. Vogeler, he has asked the question whether the granulated salt, which is pretended to be better, is more impure than crystals.

MR. VOGELER.—Yes, sir; which is pretended to be freer from alkali—whether that is so or not. I would like to have the experience of any of the members present.

THE SECRETARY.—I have no experience, Mr. President, with the granulated salt at present in commerce; but with regard to the other point touched upon by Mr. Vogeler, the crystallization of the iodide of potassium from an alkaline solution, is done chiefly for the purpose of getting it white and opaque. Iodide of potassium crystals obtained from a neutral solution are apt to be perfectly transparent. Nobody would buy it if it was transparent.

MR. PARSONS.—That is exactly the point. The manufacturer in this country who would prepare a chemically pure iodide of potassium could not sell it. It would be returned to him as fast as he sent it out. The fact is also that iodide of potassium which is made perfectly pure as regards the carbonate, is quite likely to contain chloride. That attracts moisture, and is very easily affected by the air, and will give off free iodine. It seems to me that manufacturers should be limited to the amount of carbonate which should be allowed, in order that the salt should be preserved. Pure iodide of potassium, unless free from chloride, will not keep for any length of time without giving free iodine.

THE SECRETARY.—I wish to make only one remark in addition to what Prof. Parsons has stated. A statement was made that the perfectly pure iodide of potassium could not be sold in this country. I wish to draw the attention of the members to the fact that some eight or ten years ago an English firm endeavored to introduce it in Great Britain, and that it had to give up the manufacture. The opaque salt, I believe, is sold all over Europe.

MR. VOGELER.—If this is true, I am only too glad that this discussion has been brought about, because we ought to know by all means whether iodide of potassium ought to look opaque or transparent, If the opaqueness is given by manufacturers in order to satisfy the wants of the American Pharmaceutists, we ought to be the ones to discard such notions, if we know the principle to be wrong.

MR. LLOYD.—We know that it is true regarding the bromide of potassium, that transparent bromide of potassium is not marketable. This salt crystallized from a neutral solution is transparent unless it is deposited from a very hot solution. In making bromide of potassium it has been found necessary, as I know, to have the solution alkaline, from the presence of a certain amount of carbonate of potassium, so as to prepare those peculiar crystals which the market demands.

MR. PRESCOTT.—The suggestion was made that the proportion of alkali should be more definitely limited than it has been. It was remarked in the paper that the pharmacopœias have been very lax, and our pharmacopœial test is one which admits an alkaline reaction of some variation. Of course it is difficult positively to rule out any sample on that ground. It occurred to me, thinking over the results of the examination, that if perhaps in the future pharmacopœia a limit was adopted to be defined by volumetric tests, it would be a good thing. It is a very simple matter to observe that if there be a very considerable excess of alkaline carbonate, it aggravates this difficulty, the acquisition of free iodine, by being hygroscopic, and increasing the tendency to become in a condition to liberate the iodine.

MR. REMINGTON.—I would like to ask Mr. Prescott whether he does not regard his examination as proving conclusively, that a very good quality of the iodide of potassium comes into this country and is used in the market. It seems to me, listening to his paper, that the iodide of potassium at the present time in the market was of very good quality.

MR. PRESCOTT.—I hardly want to be responsible for saying anything more than the paper says in regard to that. I should say that it was of fair quality; but considering the entire feasibility of getting a better quality, I would say we ought not to be contented with it; but I am very sorry that the pharmacists of the country should be more ready to regard the porcelain lustre, the slight opacity, and the difference in the elegance of a crystalline salt, than to regard the important pharmacopœial requirements, especially some of them which cause very much embarrassment at the prescription stand. We are apt not to think of these things, but when we see a precipitate from the iodide of iron, which has been mentioned, we think of it as something accidental, rather than being a natural result.

MR. SHINN.—I think if every dealer should order his chemicals U. S. P. standard from the manufacturers, they would provide the article. It depends upon the colleges and State Associations whether such a practice will prevail.

MR. LLOYD.—Is there not another trouble—that the iodide, and bromide of potassium when combined with salts of alkaloids, cause a decomposition in the presence of carbonates?

VICE PRESIDENT RICE.—The remark of Professor Lloyd was one I was going to make. It is a common custom to prescribe iodide of potassium in mixtures containing, for instance, bichloride of mercury, and vegetable tinctures or solutions of alkaloids, when a precipitation might result disastrously to the patient. I have known two instances in which serious results followed by parties taking the residue in the bottle when the mixture was almost used up.

MR. LLOYD.—It strikes me that there was some years ago a case of poisoning reported in California. In this case the bromide of potassium and one of the salts of strychnine were united. That case reached the courts; and it was always a query in my mind, whether the bromide or the carbonate of potassium precipitated the strychnine, and in that way made the last dose fatal.

MR. MARKOE.—The question seems to narrow down practically to a question between the consumer and the manufacturer—that the consumer insists upon a certain appearance, and compels the manufacturer, in order to sell his products, to meet this appearance. I think the shortest way, and the only progress we can make, is to have this Association, the colleges of pharmacy, and the pharmaceutical journals, insist upon the quality of the article, as determined by applying the test of the Pharmacopœia, and not by its appearance. Everybody knows that the agents of many manufacturers make a point of calling attention to the whiteness of certain crystals, when that whiteness does not depend upon palpable merits. We must educate the pharmacist to rely upon the Pharmacopœia itself, and not upon the statements of the agents of rival houses.

VICE PRESIDENT RICE.—The force of the popular demand for crystals of this color has even compelled committees appointed for revising the Pharmacopœias, both in this country and in Europe, to recognize in the officinal descriptions crystals which are opaque, and to provide for tests which shall limit the alkalinity to a certain degree. This was wrong, but it had to be done in order to comply with an existing state of facts.

Mr. Seabury, Chairman of the Entertainment Committee, read a lengthy report.

SPECIAL REPORT OF COMMITTEE ON ARRANGEMENTS AND ENTERTAINMENTS.

By Geo. J. Seabury.

In connection with the first regular report of the Entertainment Committee, I have the honor of submitting a special report, with comments and recommendations.

The policy of the Association has heretofore been pledged to invitations from members, the Association having no alternative but to select the most available place from among those offered. Local members have always been inspired by impulses beyond their means in receiving us: such meetings have been more or less successful, and depended for funds largely on individual sacrifices.

Our new departure that of entertaining ourselves at our own expense, arranging a programme of the meeting in a systematic and organized manner—owes its existence to the persistent efforts of one of our members, whose only object in bringing about this reform was to increase the usefulness, importance, and dignity of the American Pharmamaceutical Association, and to remove serious and oppressive exactions from local members. An involuntary assessment, disguised and solicited under the rosy tints of hospitality, is an unjust tax that robs the gift of its sentimental nature.

Admitting that it was a custom in the Association's *infancy* to depend wholly on local generosity, the requisite contributions could, at that period of its existence, be easily made, as it needed but a small outlay to receive and show it some special attention; yet within a few years we have grown to magnificent proportions, so that considerable expenditure is now required to entertain us in a becoming manner: very few communities are equal to such liberal donations. Not that pharmacists are unwilling to contribute to such a fund—not that their conceptions of genuine hospitality are inferior to those of any other profession—but (I hope you will pardon me if I say that) *as a class*, they have large hearts and limited purses—a modest though honorable condition. If pharmacists in our country were situated as are their fellow-apothecaries in Europe, where the State regulates the practice, and allows one pharmacy to every 5,000 or 7,000 persons -why, with our generous instincts, we would not require an Entertainment Committee, unless we met at an obscure place.

As Chairman of this Committee, it has been my pleasure to study the financial affairs of meetings that have taken place in the past: the balance-sheet of many, where the entertainment was modest but good, was unpleasant to look upon: on close inspection, I found that many of the donors to the fund were re-assessed, or requested to re-contribute to assist in making up the deficiencies, leaving local members, instead of the most agreeable reminiscences, those which were certainly not calculated to create unalloyed pleasure. The entire fund was contributed by members and non-members—non-members generally representing a large majority—therefore, we were entertained to a greater extent by those who were not members than by the actual members of our Association, which is the case at the present meeting, so far as it refers to one of our Washington entertainments.

Was it just to continue such arbitrary methods? An injustice will sooner or later right itself. To the honor of our Association, and in justice to local pharmacists in future places of meeting, let it be said that at Kansas City, in 1881, the Association emancipated itself, and, by a strong expression, declared itself free and independent.

On motion, the Association appointed a committee of three, and resolved to meet at Niagara Falls—a wise selection, as far as its attractive force was concerned, but eminently wiser, because the local representatives could not possibly entertain us undert he old dispensation. The meeting at Kansas City conspicuously suggested the adoption of an organized plan, which was put into execution as an experiment in 1882. The word "experiment" is here employed with discretion: to the Association it was an experiment, but to the prime mover this new departure had lost its novelty years ago, through travel and experience in European countries, joined to a careful study of its advantages.

The experiment of entertaining ourselves was demonstrated at Niagara Falls for the first time. Wiseacres had misgivings of its success; the committee, they said, had undertaken too extravagant a programme. A few discontented individuals, who are ever ready to be entertained at some one else's expense, remonstrated, and insisted that they were entitled to entertainment tickets, because they were members of the Association. The chairman suggested that, with their consent, he would be most happy to present their names to the Association for complimentary tickets; and, if acted upon favorably, the committee would take pleasure in complying with such resolution, and charge the tickets to the Association. A few other individuals, smarting under irritations that could in no manner whatever be overcome, met with disappointments that were as keenly felt by the committee as by themselves.

The chronic rapacity of certain hotel-keepers, livery owners, and contractors, at the Falls, has induced me to characterize them as the "pirates of Niagara." Because the persons with whom we had made bona fide contracts, stoically refused to execute their agreements, or wholly repudiated them, was it justifiable to censure the committee for failures that could not be corrected? We employed every reasonable argument to coerce refractory natives, and called attention to the gravity of their remissness and its penalties, but all our argumeuts were unavailing: commercial morality appears to be an unknown principle in those regions. In fact, so far as concerns those individuals who subsist on visitors, Diogenes (as I publicly stated in the hall), if he were living to day, would not waste an infinitesimal atom of nervous or physical energy in carrying out the mission for which he was celebrated, or, as one of our German members suggested, "would not waste even a match to light his candle."

There was also a pleasant aspect of the Niagara meeting: it was neither a financial nor a numerical failure. The attendance exceeded the calculations of the committee, which was partly due to its reputation as a natural phenomenon; whilst the entire programme was enjoyed, despite a few unimportant though perplexing embarrassments. As a pharmaceutical, social, and financial event, it was an unqualified success. The great majority were delighted, and looked forward with fond longing toward the next meeting. The committee were cheered and encouraged in their work by members whose moral support they appreciated, and that (with the programme arranged for the pleasure of the Association) was a sufficient recompense for the trials and tribulations that the committee were compelled to endure in their maiden effort. We profited much by our first experience. Our national humorist truly says that "the first time it is not your fault, but for the second failure there is no excuse, except an open acknowledgment of incompetency."

We have corrected the uninvited difficulties of the first meeting in arranging the details of the second. From appearances, and the character of present contractors, we are not liable to suffer a repetition of last year's experience. The programme must be constructed in such a manner as to induce members to bring their wives, and there are occasions when they might be persuaded to bring their entire families, so as to render our annual meeting an event in the *life* of the pharmacist. Formerly the ladies were quite strangers to one another, and in the absence of special amusements for their benefit, they actually did not know what to do with themselves: they became hotel parlor ornaments, imprisoned themselves in gloomy rooms, or perambulated the streets without an objective point. Such visits grew monotonous, uneventful, and tiresome—conditions which they were only too happy to exchange for home and friends, vowing never to repeat their experience. Were you amazed, then, when you contemplated the next annual meeting, and asked your conjugal partner to accompany you, that she not only flatly refused to do so, but employed all her feminine arts to persuade you to remain at home? Did it ever occur to members that such a feeling diminishes the number of attendance?

Under the present management, the entertainment committee have completely revolutionized such notions. *Now* the ladies plead to come. At Niagara they were delighted, it seemed to add so much to their common stock of happiness; and when ladies are content, their husbands are usually enjoying a similarly happy condition of mind. To use some of their own utterances to the paterfamilias: " Now you must be sure to go next year, for you remember how delightfully we were entertained at Niagara Falls. During the sessions, whilst you were at the meeting listening to what transpired, we were enjoying our part of the programme, and were elated over the recognition of our wants, during the time we had formerly spent in not knowing what to do with ourselves."

The records, acts, and plans of the committee are collectively the common property of the Association. We are merely your representatives, inspired by motives that promote scientific and pharmaceutical progress, fraternity, sociability, and the attendance of large numbers. The programme is always subject to curtailment or enlargement: the entire arrangements are so elastic that they can be made to conform to the will of the Association. As an example, if the time devoted to the reading and discussion of papers be insufficient, all that is necessary is to instruct the committee, on motion, to devote more specified time for that particular purpose, or any other of equal importance.

I will describe our second meeting at Washington, with a view to enable those who are inexperienced in the work to become familiar with the modus operandi. The committee's first duty is to visit the place of the next meeting, at least three months prior to the date resolved upon. The local associates of the committee of arrangements and entertainment, having been selected because of their presumed fitness for such an office, enter, in conjunction with the local Secretary, into a general consultation, which involves the varied possibilities of a contemplated programme, making due allowance for such portions as may have to be omitted. The programmes as heretofore arranged can be made the basis (as far as possible) for the forthcoming one. When the situation and means have been carefully inspected and exhausted, the next step is for the Committee of Arrangements and Entertainments to arrange the entire programme to the best of their ability. Once constructed, the preliminary details are separated, so as to assign to the local associates their portion of the work, the committee taking charge of such matters as can be executed to better advantage in New York City, or in any other business centre.

For this purpose the entire locality should be carefully looked over, and the most convenient point should be selected. The next duty is to arrange with the various hotels, receiving an approximate figure as to the number of persons that can be accommodated at reasonable rates. To dispose of the question, we must choose the most suitable hotel for headquarters, giving preference (all else being equal) to the hotel that can domicile the greatest number.

What can we do for the ladies? Our plan has been to arrange everything for them as far as possible, so as to keep their minds in a state of blissful contentment. Then we must have a concert the first evening—why? Many have arrived from tiresome journeys and need repose: we are of the same opinion as the poet who sang that—

" Music soothes the savage breast,
And sets the passions all at rest."

To say that the arrangement of a concert alone is no ordinary task, is to speak the truth. A suitable orchestra, competent singers, soloists (or specialists), a hall, a conductor, and ushers, must all be found: a pleasing programme, joined to all the varied details required to form a harmonious whole, must be judiciously arranged; whilst the engaging of proper talent, at reasonable rates, constitutes in itself an undertaking of no small magnitude, in which knowledge and experience are indispensable.

Then we must *conjure* up *accidental* introductions, and *create* events. Carriage rides to conspicuous objects of local interest will probably necessitate a raid on every livery in the town or city where the meeting is held. If one livery cannot provide sufficient rolling stock, it must be secured from some other quarter, taking care that satisfactory service is insured. The same treatment refers to a steamboat excursion, except that steamboat owners must be interviewed. The ball requires business management: a suitable hall must be engaged, music and decorations provided, order of dancing arranged, and the appointment of floor and reception committees.

Then comes a genuine banquet. To make this successful we must find an available hall capable of seating 300 persons. Music always adds a charm to such events, so that must not be forgotten, which with the varied minor details are easily realized when the occasion occurs. Then comes the arrangement of a menu and *toasts*, and last—but by no means least—the selection of a *toast-master*.

To these duties can be added publishing a programme, studying the divisions of time, so as to afford us opportunities of gratifying our gustatory nerves without undue haste: proper mastication and good digestion constitute an important act in the human economy. When the stomach performs its operations properly, the mind co-operates sympathetically. Then we must have coupons, orders of dancing, rosettes, and special badges. An efficient and reliable person (or as good as can be secured) must be drilled in for the bureau of information, and, lastly, we must execute the self-imposed duty of securing rooms in advance for visitors. Railroad rates must be looked after, excursions should be arranged for the last day, and, to complete the entire scheme, a careful calculation must be made as to the cost. Then we must form a conservative judgment of the numbers that will probably attend, and consider how much members should be taxed for entertainment tickets.

Lastly—the payment of contracted obligations, with the proper vouchers. That is all there is to it, without adding the lesser details. A conscientious investigation of the subject, in all its ramifications, will assist members in sustaining the recommendations which follow, and enable the Association to obtain the services of qualified individuals who will serve, provided we do not place too much labor in their hands. A division of duties is imperative.

Let no member be misled into the hallucination that the Committee, for a moment, loses sight of the legitimate purposes of our Association—the pursuit of true pharmaceutical progress. The ordinary affairs of business that concern us are all relegated or transferred to the Council for deliberation and completion—a wise provision—omitting the mechanical order of proceeding. The major part of the time is devoted almost wholly to the reading and discussion of papers, which, at least in my opinion, are of inestimable value, especially to those whose position, life-work and volition, enable them to labor for its advancement, and who should be rewarded by large and appreciative audiences.

By a union of two indispensable influences (pharmacy and recreation), we accomplish our aim. First, by making our programme attractive enough to insure a large attendance; second, by inducing them to attend our meetings through the silent eloquence of omitted restrictions, or, to be more perspicuous, to really *ask* members to be present, by creating events that are calculated to convince them that their attendance at the meetings will be appreciated by our officers, and the patient scientific and pharmaceutical experts. The labor of the Council has greatly increased under the new stimulus of double numbers, which practically exclude them from nearly all the *pleasures* of the meetings. I hope the Council will pardon the suggestion, but it is about time that they too divide their own work in such a manner as to afford them an opportunity of enjoying the meetings. Remember, a re-union, be the date what it may, represents nearly a yearly cycle—a "New Year's greeting;" and their friends are entitled to an interchange of the compliments of the season.

The rate fixed by European pharmaceutical societies is equal to the limit settled on by us. In the older countries the wisdom of our new course is thoroughly appreciated, whilst its necessity is recognized. In truth, the Committee of Arrangements and Entertainments is regarded as one of great importance; the number present each year at the annual meetings depends entirely on the arranged programme—if it be a meagre one, the attendance is fair or small; if exceptionally good, members are present in considerable force. We are simply repeating the experiences of the Old World, modified and elaborated to conform to our tastes, education, temperament, and idiosyncracies. The limited price of $5 (five dollars) per person, under any sky, with good business management, insures the Association an excellent programme, illuminated by events calculated to make our meetings memorable. Formerly the extreme limit of five dollars was expended by nearly every member in some form at each annual reunion, and frequently double that sum, for which we received no satisfactory equivalent; whilst under our new auspices, we enjoy thrice the pleasure, in return for an amount that could not appear lavish even to the most frugally-inclined of our members, and every member should be willing to contribute, even though they may have sentimental or physical reasons for refusing to participate in all the events.

One of the most important necessities of our annual meeting is to create sociability; this can be best accomplished by an organized effort—a deliberate plan. The veterans of the Association need no formal introduction to each other—years of regular attendance have established many indissoluble friendships and acquaintances, and at each recurring event they come and go as a family; but these old heroes are, unfortunately, in a large minority. The great majority of our present attendants come unacquainted; consequently we should entertain for new-comers the greatest solicitude; it is our duty to make them feel at ease, so that they may really enjoy the pharmaceutical and social events of the programme.

To strengthen the object of these impressions, I shall recommend that the Committee of Arrangements and Entertainments be empowered to appoint each year at the place of meeting a reception committee of three qualified members, called the "Committee of Arrangements Reception Committee." The members of this associate committee should be composed of active and well known members of the Association, whose adaptability for such a pleasant duty is established. The effect will be appreciated, especially by new members, who are likely to attend our meetings annually in the event of their initiatory visit having proved agreeable and profitable.

There have been numerous controversies on the subject of "*Where and when shall we meet next year?*"

This is indeed a vexatious problem; but it can be unraveled, and should receive careful consideration, inasmuch as the success of our meetings depends on a wise selection. On several occasions I have been solicited to present the Association with an opinion: it is indeed an act of boldness on my part to assume such a prerogative, yet I take pleasure in recommending that future meetings be held in available localities (and they are abundant), between the latitudes of 42 to 48, extending to, though rarely exceeding, longitude 93, which, as far as I can trace on imperfect scales, includes an angle of the Mississippi river at St. Paul. This territory would also embrace the east coast of the Atlantic ocean from Newport to Nova Scotia and New Brunswick, running laterally through the upper portion of the States of Maine, New Hampshire, Vermont, New York, Canada (East and West), Michigan, Wisconsin, and Minnesota (including the lakes of Ontario, Erie, Huron, Michigan, and Superior)—the time of meeting to be in July or August.

In advocating the above, you will remember that many large cities and summer resorts lie peacefully within those boundaries where, in equable temperatures, comfort may be found. We should invariably select a time for our meetings when the material prospects of our members are at a minimum when they can best temporarily separate themselves from their business interests, and enjoy a week's mental and physical recreation. Every pharmacist takes at least one week's vacation; if he be a true disciple of the craft, he will readily understand that a moderate temperature, ranging from 60 to 85 degrees Fahrenheit, with a bracing atmosphere, vitalizes his mental powers, invigorates his frame, and insures a higher amount of comfort and pleasure than sweltering or basking in a depressing climate, under the scorching rays of his caloric majesty. I am led to believe, inductively, that it is impossible to transform the immutable instincts of human nature, and, on that account, console my mind with the pleasant thought that many of our members will cheerfully substitute our meeting in place of their regular vacation. If we choose an inconvenient time, or an objectionable locality, we shall simply diminish the number of attendants. To express the two ideas laconically, we should *combine pharmacy with comfort.* Although the Association is now free and independent in the selection of places where a meeting is to be held, we should, nevertheless, always courteously recognize the right of members to invite us to special locations within or without the recommended sections; and, while we are conscious of our liberty, yet, in meeting at any place by solicitation or resolution, the Association should be ever ready to accept some voluntary token of hospitality from the local pharmacists, and include same in our official programme.

The Committee must have a paternal regard for every detail, since one weak part tends to weaken the whole, no matter how strong the balance may be.

And that is another sound reason why the Local Secretary should be more than anxious to meet and consult with the Committee of Arrangements and Entertainments, prior to the selection of a suitable spot for the Pharmaceutical Exhibition, or of a place in which to hold our sessions.

The necessity and general appreciation of receiving reduced railroad fares before, and the arrangement of suitable excursions after our meeting, has grown to such respectable dimensions that it requires particular and undivided attention. Superficially, the pool system, and its tributary connections, suggests itself as an arbitrary and invincible power; yet we are in possession of the most convincing evidence that the assurances of its agents are subject to circumspection, on the ground that many of our members in interior cities and localities have secured better rates than those afforded by the "pool managers."

In view of these facts, and the growing importance of receiving concessions on regular rates for the benefit of attending members, I would respectfully recommend that such matters, together with the arrangement of excursions, be placed in the hands of a special committee of four members, appointed either by the Association or by the Council—such members to represent the East, West, North and South—whose duty it shall be to secure the best possible terms, and to arrange for special excursions within their respective territories, or any other, of common interest to returning members. They shall also be empowered to appoint associates in their assigned sections to assist them. Furthermore, it should be their duty to publish, at least one month in advance of the time of meeting, a circular embodying the results of their investigations. Such information should be simultaneously forwarded to every Pharmaceutical Journal in the

United States, for gratuitous publication, with the request that the same shall be continued up to the time of meeting.

For the benefit of a railroad committee, I take pleasure in stating that, at many railroad centres, several of our members, who enlisted themselves for the general good, could have chartered a special car at reduced rates; therefore it would be advisable to suggest to those residing within easy traveling distances, that they should concentrate at such points; the journey would also tend to relieve the reception committee from generally introducing the assembled company to one another.

The securing of rooms in advance for visiting members, while it is unquestionably a great convenience, still, like all other beneficent matters, has its sunshine and flitting shadows. With due respect to all who have confirmed invalid wives and companions, yet there is a large class of applicants who, taking advantage of the Chairman's strong prejudices in the direction of humor, assure him that they will be accompanied by invalid wives, relatives and friends, who are more than anxious to secure the best rooms on the first floor. I can assure my fellow-members that such rooms are limited in any hotel. If I had my choice I would build a hotel in a circular form, operated on a pivot, each floor of the four or six traveling in opposite directions, so as to enable occupants to have a continuous panorama of the hotel surroundings, and assign to each member a room similar to the one described to me by one of our Brooklyn soothsayers, a copy of which reads almost verbatim as follows:

"Yours received, containing $10. As you require the 'best room' in the hotel, I will have the bridal chamber with bay window reserved for you. It will meet your views perfectly. It contains a piano and organ, mosaic floor, tapestried sides, hung with pictures by modern painters; frescoed ceilings by Rubens; furniture, style of the Renaissance; perfumed baths; ivory carvings; Chinese slaves as attendants; and is surrounded by an orchestra of resurrected Egyptian mummies, who will play Abyssinian and Zulu compositions in the subdued key of A flat. If you desire more, ask for the earth, and we will roll it over your way."

The assigning of rooms is a thankless, though generally questionable act of courtesy to a very few, who apply late, and expect the best rooms. Still, after a necessary explanation, good sense comes to the rescue, and all feel that the distribution has been founded on equity. The few experienced travelers understand how to protect themselves; but a very large portion are not so fortunate, and feel the material influence of a committee who willingly undertake such a troublesome operation for their benefit. All who applied directly to the committee, as per our offer, and otherwise, were protected; those who failed to avail themselves of it, had equal chances with those who, up to the last day, could not definitely state whether they could be present.

Therefore, I respectfully recommend that hereafter the securing of rooms be placed in charge of the Committee of Arrangements and Entertainments' local associates, thus relieving the general committee, who will have enough to engross their entire attention prior to and during the meeting.

No member should ever consent to act on or join this committee unless he have ability and sympathy in its operations and ideas: two factors of the highest importance in insuring best results. This same observation refers to its local associate committee. The work is often surrounded by seemingly immovable obstacles, so that it must be in itself sufficiently sustaining to remove (for the general welfare) any presumptuous barriers that may be interposed. The speculative part requires conservative management. The committee is pledged to insure every member full value for the price of entertainment tickets, whether it be $5 or $3. If entertainments cannot be supplied from local resources, the deficiencies must be supplied from the most accessible channels. The faculty of creating events is desirable; so is sound judgment in calculating the cost of the largest as well as the most minute details.

The labor of this committee is indeed arduous; but when it is composed of individuals who have natural abilities for the work, their pleasure is intensified by arranging diversions the object of which is to give pleasure to their fellows. The necessity of separating and organizing this and associate committees, is to prevent friction, so as to render impossible, as far as may be, those habits, often attributable to too great an enthusiasm, that some possess of encroaching on unassigned duties. "Too many cooks spoil the broth" is a homely proverb, yet its unpleasant effects are exhibited even to this day by thoughtless or inexperienced persons, more on account of a want of discipline than a wanton disregard of their allotted duties. Therefore I respectfully submit the following recommendations:

First.—That the name of the committee be changed from the Entertainment Committee, to that of Committee of Arrangements and Entertainments.

Second.—That the Committee of Arrangements and Entertainments shall hold a conference at next place of meeting, at least three months prior to date of same, to which shall be invited the Local Secretary and Local Associate Committee, for the purpose of consulting about the ways and means, and ability of constructing a suitable programme.

Third.—That the Committee of Arrangements and Entertainments be composed of three qualified members, elected by the Association or appointed by the Council, but responsible only to the Association, residing, if possible, in the same city, for the purpose of meeting frequently for consultation, whose duty it will be to arrange the events and programme for each annual meeting. The Committee shall also have the power to appoint hereinafter named sub-committees at each annual meeting, namely: the "Local Associate Committee," and "Committee of Arrangements' Reception Committee." The records of the Committee to be lodged for safe keeping and reference with the Permanent Secretary. The treasurer of the Committee of Arrangements and Entertainments to be appointed by the Association or Council. Any funds to the credit of the Committee shall be considered independent property, to be employed as the Committee or Association may deem advisable.

Fourth.—The Local Associate Committee shall consist of two or more members, optional with the Committee of Arrangements and Entertainments, whose duty it shall be to contract for and execute such parts of the programme as shall be adjudged necessary to transfer to them for execution, but who will not be invested with the power to close any contract, or create any liability, unless indorsed and approved by the Committee of Arrangements and Entertainments in writing. It shall also be their duty to secure rooms for all members who write in advance; entertainment tickets can be secured at the bureau of information during the meeting.

Fifth.—The Committee of Arrangements' Reception Committee shall consist of three members, whose duty shall be to receive members, and to introduce them to each other, as well as to render such courtesies as will tend to create greater sociability among attendants, in which capacity they shall continue to act throughout the entire meeting.

Sixth.—That the Railroad Committee shall be composed of four members, appointed by the Association or Council, representing the Eastern, Western, Northern and Southern States, whose duty it shall be to manage for the Association all matters referring to railroad rates and excursions, and to publish, at least one month in advance of the time of meeting, a circular containing railroad rates, a plan of arranged excursions, and all information connected with the subject—the Chairman to reside at the most important railroad centre.

Statistics are the truest tests for comparison. Under the old regime, our meetings were attended by from 150 to 175 persons, seldom rising to 250 or 300—only once in the past have those numbers been exceeded, and that by the most engrossing and seductive of attractions—the Centennial Exhibition, in 1876. I am under the impression that at that meeting nearly 400 were present. Since then, we have had no such meeting until we introduced the present plan.

At the meeting held at Niagara Falls, in 1882, over 540 persons attended, whilst the second or present meeting at Washington is estimated at 525, both showing an attendance of over 500 persons. No wonder the precentor's heart is made glad, when with his happy face and happy speeches, he smiles and snaps his fingers at adversity. The fact indelibly remains that the entertainment plan received hearty and almost unanimous support; 381 tickets were sold. It is not my pleasure to criticise the few who were unwilling to contribute towards maintaining the dignity of our Association—they are entitled to their own reasons; but the overwhelming majority who endorse the method is an emphatic affirmation that must not be underestimated by the extremely limited faction who were unprepared to sustain its advantages, and who were unwilling to support the Association in its successful work. There are individuals who would, true to their characteristics, oppose perfection.

And now, Mr. President and fellow-members, let me assure you that the recommendations contained in this report are based on an impartial and conscientious study of the subject, entered into as a means of defense of its advantages, and for the future protection of the Association's interests and strength. I considered myself personally responsible for its success or failure; both meetings were superlatively successful. The Association granted exceptional powers, which in no instance were abused. My reward for this self-imposed though pleasant undertaking will be complete, if kindred associations follow and perpetuate an example worthy of general adoption.

After the report of the Entertainment Committee had been read, considerable discussion took place. President Thompson occupied the chair.

Mr. Ebert.—I move that the report be accepted, and the committee discharged.

Mr. Roberts.—I move to amend that motion by instructing the Committee on Entertainment to pay over to the Treasurer of the Association the funds in their hands, for the general use of the Association.

The President.—It is moved and seconded that the report of the committee be accepted, and the committee be discharged, and that they be requested to pay into the hands of the treasurer of the Association such money as they may still have on hand.

Mr. Hallberg.—I would like to ask the gentleman what he means by stigmatizing the meeting at Kansas City as an utter failure. I was there, and there were many members from the West and North. We enjoyed ourselves—perhaps not as much as they do in the East, but we enjoyed ourselves. I would recommend him, as he said that he intended to re-write his paper, to eliminate that statement from it, as I consider it is not correct.

Mr. Remington.—There are some recommendations in this address, and I would like to have the report accepted, and referred to the Committee on the President's Address. I offer that as an amendment.

Mr. Ebert.—I should prefer not to accept this amendment. I think that the recommendations of the report are of such a character that we had better go into the hotel business. The Association does not come for entertainment solely; it comes for other purposes. If we were to carry out such a programme from time to time, we had better form some other organization than the American Pharmaceutical Association. I hope that this will be the last of any committee of this kind to take charge of our entertainment. I think that we can entertain ourselves in a rational manner.

Mr. Remington.—Mr. Chairman, with all due respect to what the gentleman has said, I feel that it would not be right; we have to dispose of this report in some way, unless you vote to lay it on the table and thus dispose of it. Now we have an excellent and judicious committee on the President's Address. That report has been made and presented to the Association, and we should do something with it. If the Committee on the President's Address think that it contains no recommendations of any account, they will say so; but I hardly think it proper to receive reports here from committees which have been regularly appointed by the Association, and then do nothing with them.

Mr. Roberts.—Before that report is placed in the hands of the Committee, a great many special references in it might be eliminated, and some special features left out; even leave out the poetry, if you choose, and it would be a better report. I don't think that the facts and statements bear out the report.

The President.—The Chair hears no second to the amendment.

Mr. Kline.—I second the motion of Prof. Remington.

The question being on the amendment, it was adopted.

The President.—The motion as amended is that that the report on entertainment be received and the committee discharged; that it be directed to pay over to the Treasurer of this Association any unexpended money in their charge; and that the report be referred to the Committee on the President's Address as to the recommendations in the report.

Mr. Gordon.—I want to ask one question. That money has been obtained outside of the ordinary way of the Association, and the question arises in my mind, What right has the Association to that money? I suppose originally it was intended that this Entertainment Committee would be so continued that the money should then be used as a fund, provided that in some entertainments we should fall short to make up the amount that would be required. I don't see what authority we have to take and turn that money over to the Association.

Mr. Markoe.—The point taken by Mr. Gordon is a good one. A large part of that money was contributed by those who were not members of the Association. If I understand it, the object of contributing to the entertainment fund was to create a fund separate from the funds of the Association. I don't think that the Association has any business with it whatever, except to continue its use in the way of entertainment either to this meeting or some other assembly.

The President.—As the Chair understands the matter, the motion does not devote this fund to any other purpose; it only directs that it is to be put into the hands of the Treasurer, and the Association may dispose of it as it may think profitable.

Mr. Markoe.—If it is going into a fund in the hands of the Treasurer for entertainment, I have nothing more to say; but if it is going into the general funds of the Association, for Association purposes, I do protest.

Mr. Roberts.—My object in making that amendment to Mr. Ebert's motion was for the purpose of getting rid of this committee. It has failed to realize the hopes we had of it when we created it. I say plainly—I do not wish to give displeasure to any one—that I think as one of our servants (I am speaking of the committee) that they have not behaved well. If the funds in the hands of that committee are placed in the treasury, if the committee is to be discontinued, and if we are to dispense with their valuable services, I think that we can do nothing better than to appropriate the money now in their hands to more useful purposes than they have put it to.

MR. ENGLAND.—I would like to know what is to be done with the money. Does it go into the general fund, or does it go to form a special fund?

THE PRESIDENT.—It would go into the treasury of the Association, and the Association may dispose of it as they think proper.

MR. ENGLAND.—I have no wish to have the committee discontinued. If this resolution was separated so that I could vote for the receiving of the report, I should be pleased to do so; I cannot vote as the resolution now reads. I think that the members have a right to see that the money subscribed for a special purpose is devoted to that purpose. I call for a division of the question.

In accordance with the suggestion of Mr. England, the vote was taken separately on the four clauses embraced in the motion; and the question being taken on receiving the report, it was decided in the affirmative. The second clause of the resolution, discharging the Committee, was likewise adopted.

The question being on the third clause of the resolution, that the Entertainment Committee be directed to pay over to the Treasurer of this Association any unexpended money in their charge, a division was called for, which resulted in 25 affirmative and 45 negative votes; so this part of the resolution was declared lost.

The fourth and last clause of the motion, that the recommendations of the Entertainment Committee be referred to the Committee on the President's Address, for consideration and report, was then adopted.

MR. ENGLAND.—In reference to the funds on hand, I make a new motion—that the money now in the hands of the Entertainment Committee be paid into the hands of the Treasurer of the Association for the use of future entertainment.

MR. MENNINGER.—I would like to inquire whether some of this money now on hand we are not obliged and morally bound to use for the obligations incurred in this city by this committee. I think that we are. This committee is an authorized committee of this Association. Whatever our policy is in the future, we are in honor bound to stand by the Committee as far as the engagements made in our name for us are concerned. I would amend the motion that the unexpended balance be paid in.

MR. ROBERTS.—It is presumable that if this money has been paid into the common treasury of the Association, that the Association would not repudiate the debts of its agent—this Committee. It would have taken perhaps the same course as in the hands of the Committee, and that is a difference between six and a half a dozen, to my mind.

THE PRESIDENT.—It would seem to the Chair that if the Association accepts this money they certainly would accept the responsibility of paying any unpaid bills that the Committee might have not yet settled.

THE SECRETARY.—At the last meeting at Niagara Falls, the Association bound itself to pay in case there should be a deficiency, without limiting the amount. The whole funds of the Association are pledged by a special resolution.

THE PRESIDENT.—The motion now before the house is as to the disposition of the funds; and the motion as it stands was that the unexpended balance be paid into the hands of the Treasurer to be kept as a separate fund for any future entertainments. Now Dr. Menninger proposes as an amendment that the unexpended balance be paid over.

MR. SHINN.—Before you put that motion, I would like you to make some provision to put us in such a shape that the Association will stand by the Committee in case there is a deficit. You are assuming that there is going to be a large balance handed over to you. If you undertake to put life and breath into the motion, there may arise some complications; the Association would perhaps have to meet obligations of not less than $800.00 or $900.00. Perhaps it would be wise for you to make some provision for that, since the balance that would be paid over to you is uncertain. It is a poor rule that don't work both ways.

It was again stated, that by special vote, the Association had pledged itself, in 1882, to an unlimited amount to pay any future deficiency of the Entertainment Committee. Before a vote was taken, Mr. Sayre, of Brooklyn, moved as a substitute for the pending motion, that the balance remaining in the hands of the Committee for 1882 be paid over to the Entertainment Committee of 1883. Before this substitute was acted on, the question was raised whether, by the vote to discharge the Committee, that of 1882 or the present Entertainment Committee was discharged?

Mr. Menninger, seconded by Mr. Holmes, moved a reconsideration of the vote by which the Committee was discharged. A division was called for; and on taking the question, a small number voted against, and a large number in favor of reconsideration; and, without counting the votes, the motion to reconsider was declared carried.

MR. MENNINGER.—I believe the question now is on the discharge of the Committee. With reference to that question, I desire to say that the Committee is discharged by the authority by which it was appointed as soon as its successor is appointed; and until its successors are appointed, I see no necessity for discharging the Committee at this time. A new committee is to be appointed by the President, and when the time comes for that appointment, if we desire to entirely abolish this office, that is the time to take that action. When the time comes for the appointment of a new Committee, this Committee goes out of office upon finishing the labors of this year. I see no necessity for discharging the Committee at this time, unless we want to give up the whole programme that this Committee have so carefully laid out.

MR. SHINN.—I think that it would be eminently unjust to the Committee to discharge them at this time; I do not think the Association understands what was meant by this resolution, or the members would have voted for it at first; I think that it was a mistake. This Committee has worked hard and labored earnestly for our entertainment; and because some of the members are not satisfied with the results of their labors, I think it is an injustice that they should be cut off in this way. Not only is it unjust, but it is impolitic.

On motion of Mr. Holmes, the motion to discharge the Entertainment Committee was laid upon the table.

The President appointed the following Committee on the suggested meeting in California: Albert E. Ebert, Chicago, Ills., Chairman; E. W Runyon, San Francisco, Cal.; H. E. Holmes, Walla Walla, Washington Territory; S. A. D. Sheppard, Boston, Mass., and John Ingalls, Macon, Ga.

On motion, the Association adjourned to meet on the following morning at 9 o'clock.

FOURTH SESSION—THURSDAY MORNING, SEPTEMBER 13, 1883.

The slim attendance in the meeting-room delayed the opening of the session until 9:45 o'clock, when President Thompson took the chair and called the meeting to order.

The Minutes of the Third Session having been read by the Permanent Secretary, they were approved.

MR. REMINGTON.—Mr. President, there are a number of very valuable papers to be read before the Association, and the Chairman of the Committee on Papers and Queries is here; but it seems that many members were under the impression that there was to be no meeting this morning, and that the programme of the Entertainment Committee was to be carried out. It is on the programme that there will be a meeting this afternoon, and then we will have undoubtedly a large attendance. In view of these facts, and of the fact that it would be very desirable to have these papers read before a large body of the Association, I think that it would be well for us to adjourn. I am not prepared to make the motion, but I merely throw it out as a suggestion for others to act upon.

MR. SHINN.—Mr. President, it is my impression, from conversation with a number of gentlemen at the hotel this morning, that it is generally understood that there will be no session here this morning, on account of the clearing weather, but that the programme of the Entertainment Committee will be carried out; consequently they are not here. I think it is very desirable that we should have a full meeting when these papers are read, as it provokes discussion and disseminates knowledge. I, therefore, move that we adjourn until this afternoon.

MR. EBERT.—Before that question is put, it might be well to consider whether we might not read the papers for the benefit of the few who are here. I fear, gentlemen, that if we adjourn now and wait until three o'clock, we will not get through with the business that is to come up before this meeting. There will be questions at the next session brought up by the council, and miscellaneous business which always takes time, and the result will be that the papers will have to be read by title, and we shall not get any benefit from them now. We have very valuable papers, the writers having spent a great deal of time upon them; and I think in justice to them, the papers should be read. Not reading them I would call a discourtesy. We have come to this meeting for the benefit of pharmacy and of science; if we come here simply for the purpose of being entertained, it will ruin the Association; we must put a stop to it somewhere. If we were to go on in this way, the entertainments will interfere very materially with the work of the Association at this and future meetings. I do hope that we will stay here and have the papers read.

MR. SLOAN.—I am heartily in accord with the remarks of Mr. Ebert, and am opposed to adjourning until this afternoon. This is the third day, and only one paper has been read, of all the papers which are in the hands of the committee. In this scientific Association we should attend to the proper business of the Association—if this is to be a social organization, let us drop the subject, and not issue any queries. As a member of the Association, I want to hear the papers read, and have a discussion upon them, so as to get the full benefit which is to be expected from our meetings. We cannot read the papers at home and get the benefit of the interchange of opinion of the members of the Association, therefore I oppose the motion to adjourn, and hope it will not prevail.

MR. SHINN.—It should be considered whether those who are here now will not also be here this afternoon, and in addition a great many more.

MR. REMINGTON.—At this meeting I think the Association is in a peculiar position. By reference to the report of the meeting in Niagara Falls, it will appear that there—I think very improperly, but still it was done—we put ourselves into the hands of the Entertainment Committee, whose programme has been widely distributed, and it is generally understood that unless some unusual cause renders it necessary, that programme will be followed. I personally would very much prefer to stay here this morning and go ahead with the business. I have always taken this position. At the same time in deference to many members of the Association who are not here, and who will be disappointed at not hearing these papers read, we should take them into consideration.

THE PRESIDENT.—The motion to adjourn not being seconded, there is nothing before the house, and we will proceed with the business.

MR. DIEHL.—A vast amount of the time was consumed yesterday in the reading of the report on the Entertainment Committee, and by the discussion on that subject. It seems to me very proper to refer hereafter all matters pertaining to entertainments to the Council. I therefore move that hereafter all business relating to entertainments be referred to the Council, and that any discussion thereon in the sessions of the Association be declared out of order.

Mr. Diehl's motion was seconded by Mr. Rice, and unanimously adopted.

The Secretary read a letter from the proprietors of Fort William McHenry Hotel, inviting the Association to hold there the next annual meeting. The letter was referred to the Committee on the time and place of the next annual meeting.

The Association then proceeded to the reading of papers, the members gradually making their appearance in the meeting-room, until a fair attendance was present.

The first paper read at this session was by Mr. Kennedy, on the Volatile Oil of Sweet Birch Bark (see page 397); it was accompanied by samples of this oil, and of the oil of gaultheria.

MR. PARSONS.—Has any difference been noticed between the two oils?

MR. KENNEDY.—Mr. Pettigrew failed to find the terpene in the oil of birch. My paper shows that in the process of preparing the oil of birch the terpene is lost.

MR. PARSONS.—If the two oils were mixed it would be difficult to prove it?

Mr. Kennedy.—I think it would be difficult to prove that.

Mr. Parsons.—Did Mr. Pettigrew examine the oils with the polariscope?

The Secretary.—I am under the impression that the optical behavior of the oxygenated portion of the two oils was experimented with, but I cannot speak positively on that subject. Regarding the statement of Mr. Kennedy, that in the oil of birch the hydrocarbon was likewise obtained, I think that this should be taken with some caution for the present, until it is absolutely proven. In the distillation of the oil of wintergreen from the leaves, I have not the slighest doubt that the separation of the two oils, of a light hydrocarbon and of the heavy methyl ether, does take place to some extent during the distillation, and by uniting these portions subsequently, we would get the oil of wintergreen different from that now in the market.

I have had some conversation with Mr. Pettigrew as to the oil of birch in the market, which consists altogether of the ether, and is entirely free of hydrocarbons. I corresponded with several manufacturers in reference to oil of wintergreen; among them with a gentleman residing in the New England states, who is a member of this Association. I suggested to him the idea that the oil of wintergreen was probably composed of two oils separated during distillation. But he informed me positively, that notwithstanding he has distilled for a number of years, he had never noticed it; the specific gravity of his oil of wintergreen, however, I do not know. I could not get a sample, but expect to get it during the fall. The sample of oil of wintergreen, which I owe to Mr. Kennedy, differs so very materially in specific gravity from the oil of sweet birch, that it occurred to me then that very likely the difference was solely owing to the presence of that hydrocarbon, which was noticed a number of years ago, but which a few years ago Mr. Lloyd could not find. I remember that paper of Mr. Lloyd's in reference to salicylic acid from oil of wintergreen, where there was no hydrocarbon present. I believe that Mr. Kennedy's sample of oil of wintergreen, will prove to be entirely free, or nearly so, from hydrocarbon; it is a fine specimen. That which I have contains hydrocarbon, but its nature has as yet not been ascertained. It will be investigated probably during the coming season, if we can get reliable oils from different sections of the country that we know to be prepared from wintergreen leaves. I had some conversation with one of our fellow-members, Mr. Main, and he told me that he had in his possession large quantities of the two oils, which he had handled for several years; that he was perfectly well satisfied as to what was real oil of wintergreen, and that the specific gravity of that came very near the specific gravity of the oil of birch. It would seem, therefore, that for some years past in the distillation of oil of wintergreen, the hydrocarbon if present was rejected, but it would be a curious thing if in the oil of birch there existed likewise a hydrocarbon. In the case of the birch, it must be remembered that the oil does not pre-exist in the bark, but is formed by decomposition.

Mr. Lloyd.—At the time salicylic acid was introduced into this country, a demand sprang up for it; there was a well-known German acid in the market, and we undertook to make it from a good oil. We obtained the oil warranted pure on the market, as pure as we know it. I wrote two articles for the American Journal of Pharmacy, if Prof. Maisch will remember. In the process of decomposing the oil at certain times the hydrocarbon might rise to the surface and could be decanted or drawn off from the lower liquid. Afterwards I found that commercial oil of wintergreen would not yield this light oil. I have since found that in making salicylic acid—the quantity I use being twenty-five pounds at a batch—the oil of wintergreen is absolutely free from any overlying oil, leading me to believe that the oil of wintergreen first used was adulterated. The only reason I can see for these hydrocarbons disappearing during late years is that the wintergreen oil that we have used did not contain foreign admixtures.

MR. MILLER, of Philadelphia.—While this subject is under discussion, it might be proper to inquire as to whether there is any oil of wintergreen in the market that is obtained from other sources. Perhaps some who are present can tell us about it.

MR. LLOYD.—It was stated two or three years ago to me that part of the wintergreen oil of commerce was artificially made from salicylic acid. Last year we had again information to that effect.

THE SECRETARY.—I know that at the Centennial Exposition there was an artificial oil on exhibition, in the German department; that, however, had an odor somewhat different from the usual odor—a kind of harsher or smoky odor. Very likely, in the mean time, that has been improved in consequence of the improvements in the manufacture of salicylic acid.

MR. MILLER.—My inquiry was rather as to whether it was an article of commerce—and whether a part of it that we purchase is artificially made.

THE SECRETARY.—I learned that the artificial oil was made in large quantities, and so presumed it might be commercially obtained.

MR. DIEHL.—It seems to me that the oil of birch, presented with Mr. Kennedy's paper, has an empyreumatic odor; perhaps, if this odor is removed there will be no difference at all. I would like to know if Mr. Kennedy can give us any information as to the probable cause of the empyreuma, and whether this odor is not due to over-heating.

MR. KENNEDY.—I received the oil from the manufacturer, who did not know anything about the oil of birch, except by name. I believe the material is thrown into the stills, and the heat may be higher or it may be lower, just enough to keep the oil coming over; that is all they look to. A gentleman wrote to me that he had noticed oily globules floating on the surface, but did not know that they were valuable; he noticed too, that after the milky distillate stood for some time, quite a considerable portion of the oil globules floating on the surface separated with the ether and went to the bottom—but not all. He was the only one who wrote that way; of course, there would be certainly some terpene in that oil. In reference to the ounce furnished to Prof. Maisch, great care was taken with that, for it was an intimate friend of mine who made it—and then he only made about an ounce and a half of it. I believe that is absolutely pure, and contains nothing else. During the year—between now and the next meeting of the Association—I want to make further researches. Perhaps I shall be able to find out something further in reference to the manufacture of the oil of birch. I want, if possible, to collect some of the terpene or hydrocarbon, and place it here on exhibition.

MR. DIEHL.—My object in drawing attention to this distinction in the odor, is simply to qualify the statement made in the paper. I think it is due to empyreumatic oil.

MR. KENNEDY.—I thought the same, and some others have thought so too—that the oil of birch was much stronger than the wintergreen.

THE SECRETARY.—I can tell Prof. Diehl that the distinction in the odor is not solely due to the slight empyreuma present there. There is an indiscribable distinction between the two. You cannot describe odors, but I think that a person who has got accustomed to these slight differences, could easily tell the two apart.

MR. DIEHL.—That has reference to other samples of oil.

THE SECRETARY.—Oh, yes, sir; other samples of oil.

Mr. Remington read a paper on quinine pills, written by Mr. V. Coblentz in answer to query 1. (See page 384.)

MR. PARSONS.—Mr. President, the purity of the goods furnished to the retail trade by the manufacturers is a legitimate step for inquiry and study. Papers of this sort, it seems to me, are of the greatest value and importance to the profession at large. This paper, it strikes me, is one very carefully prepared; and I think some of the points it may be well to consider at this time.

In the first place as to the amount of water of hydration in the sulphate of quinine, as furnished in the American market. The United States Pharmacopœia provides seven molecules in the formula. You sometimes find six, sometimes seven, and sometimes eight molecules of water. In point of fact, however, in the examination of over one thousand samples, I have not obtained more than three or four samples which contained eight molecules of water. Sulphate of quinine furnished by foreign and American manufacturers, frequently contain seven molecules of water, and fully as often less, from six to seven molecules. This water of hydration is very important. The less water is combined with the crystals, the more valuable is the quinine, other things being equal. It is noticeable also that particular brands of quinine run pretty uniform in the amount of water when originally opened, the foreign having seven molecules, and one American sample containing from six to six and a-half molecules. I do not think the manufacturers are entitled to eight molecules of water in these calculations; they are entitled to but seven. They should have their just dues, but no more. Now as to the use of De Vrij's process for the assay of sulphate of quinine pills: This is a process which has been very widely and repeatedly published in the journals for a number of years; it is the best process I think for the analytical examination of sulphate of quinine, but it is a process which is very dangerous; it is one where the slightest deviation from strict care will result in very awkward results, to say the least. For instance sulphate of quinine, which is remarkably pure, and which with the strictest application of the process gives 99 $\frac{65}{100}$ per cent. of sulphate of quinine, would yield 94 $\frac{67}{100}$, and sometimes 93 $\frac{97}{100}$ per cent. when the conditions were slightly modified. This is a process which only an expert or one who makes very frequent quinine assays should use. It is one which has led to a great deal of misunderstanding, and which will certainly fail, unless applied daily.

Another point is this: De Vrij's process has been applied to the assay of these alkaloids, and it has been assumed that the alkaloid not obtained as herapathite is a foreign alkaloid. Now this does not follow at all. In all the different methods of separating quinine a certain amount of foreign substance is obtained, notably in the process where sulphate of quinine is decomposed in an aqueous solution with ammonia in the presence of glucose. These substances, especially glucose, are extracted in small amounts, along with the quinine, and are weighed with the quinine. Now we have an amount of alkaloid, so called, which is not pure; and, in getting the amount of pure quinine by De Vrij's process, it does not follow that any difference between these two quantities is foreign alkaloid. Any one making the charge that sulphate of quinine pills of sulphate of quinine contain foreign alkaloids must substantiate the fact. What are those foreign alkaloids? Have you separated them? That is a matter that has been overlooked; it is an important matter, and one affecting the honesty of reputable firms. Therefore, Mr. President, I am glad to see this subject investigated and examined by the best methods; but I wish it distinctly understood that there are chances for error by De Vrij's process, and persons making the charge that foreign alkaloids are present must substantiate their charge.

MR. PRESCOTT.—We have a pharmacopœia test for sulphate of quinine, especially as regards the standard of purity; and, in respect to the cheaper alkaloids of the bark, we have had such a test for very many years. We have Liebig's test, depending upon solubility, and we have Kerner's test, also depending upon solubility, and we have the test in the German Pharmacopœias of 1872 and 1882, and the present and previons editions of our own pharmacopœia. Now it seems to me that all that can be required of manufacturers of sulphate of quinine in this country and in Germany, as regards the cheaper alkaloids—other than quinine—is that the article shall be supported by the pharmacopœia test—that five cubic centimeters of the solution, at fifteen degrees Centigrade, shall not take more than seven cubic centimeters of the standard water of ammonia. It seems to me that that is all that can be required of our manufacturers of sulphate of quinine. We are supported by the pharmacopœia, and the pharmacopœia does not stand alone in this requirement, for I call your attention to the fact that it is also contained in the second edition of the German pharmacopœia. The test was officinal in the first edition of the German pharmacopœia; and, after a careful study and a very thorough discussion by the committee of revision of that pharmacopœia— I had the pleasure of receiving some letters from Prof. Flückiger upon that point in particular—that test is re-established, and remains in the present German pharmacopœia; so I think very few tests in our pharmacopœia stand better supported than this test as regards the cheaper alkaloids.

As to the interpretation of that test, you should understand that the cheaper alkaloids are not totally excluded by it. The percentage in our pharmacopœia is placed very low —not over one per cent. That is, in the first place, upon the authority of Kerner himself; and, from numerous experiments, which were repeated and commented upon in this country and elsewhere. The experiments were made with the chemically pure salts—so nearly pure as they can be obtained, by mixing them in various proportions and subjecting the mixture to the test. It has been suggested that when the alkaloids are crystallized together the behavior in the test was different from the behavior of the alkaloids mixed. It is sometimes very strange that it should be so, as the salt is dissolved before the test is applied. It is a matter of scientific research. Now I submit that there can be no requirement of purity of sulphate of quinine in pills made which would not hold good for the sulphate of quinine in the salt; hence those analyzing the pills made with Rosengarten's, or with Powers & Weightman's sulphate of quinine, should ascertain the standard of purity as laid down by the pharmacopœia, but it seems to me it is not quite fair to follow De Vrij's process to the exclusion of the other.

My own judgment in regard to the method is that it should remain at present within the domain of scientific research. I don't know whether we are quite sure as to the results, and I speak with a great deal of hesitation on this subject. I think that in this country and in Europe we are only in a position at present to enforce the pharmacopœia test as regards the cheaper alkaloids, and we should investigate further as to the interpretation of that test, as to De Vrij's method or other still more elaborate methods of exact and full separation of these alkaloids.

I submit that in the analysis of quinine pills—I do not say this with a spirit of criticism, nor have I been able to follow the paper read in all points understandingly—we have only two things to do: First, extract all the alkaloid; and, second, apply Kerner's test. It can be done; the quinine may be tested in the manner prescribed by the pharmacopœia. The residue is warmed with sulphate of ammonium, when it is very easily transformed into sulphate of quinine, and may be subjected to the test precisely the same as sulphate of quinine in crystals. I have applied this test; and it seems to me the only requirement that should be made, is a sufficient amount of the alkaloid, the purity of which is justified by the pharmacopœial test for free quinine.

MR. DAVENPORT.—In the State of Massachusetts, where we have an adulteration law, and where I am one of the examiners, it is the pharmacopœial test alone which is used.

Mr. Vogeler called attention to the distribution of advertisements in the meeting-room, which had been going on for some time, and moved that the distributing of such matter be prohibited. The motion was seconded by Mr. Remington, and agreed to.

Mr. Oldberg then read a volunteer paper on Specific Volumes (see page 330), which was accepted and referred.

MR. RICE.—The instructions to the Committee of Revision of the Pharmacopœia included the construction of such tables, which the committee was compelled to promise for a supplement. The committee had been unable up to the time of the publication of the Pharmacopœia to elaborate these tables; in fact they could only be elaborated after the book was printed, because some of the formulas were subject to possible change up to the last moment, and on account of the necessary calculations. It would have required the labor of three or four months, because it was necessary to make very exact examinations of the specimens, and take the specific gravity. The table I have reference to is the one that gives the relative proportion of volume to weight; in that table will be provided a column which corresponds in some measure to what Mr. Oldberg refers to in his paper. His will be more practical, because it seems to convey more quickly the information that is desired, the amount of weight for a certain volume. That table gives two columns: one thousand grains measure so many minims, and in the other column one thousand minims weigh so many grains; on the other side, one thousand grammes so many cubic centimeters, and one thousand cubic centimeters so many grammes.

MR. OLDBERG.—I am glad that there will be a table prepared showing the weight The form of the table was not discussed, and my friend Mr. Rice, undoubtedly knows that in reference to this matter my paper is original in so far that I could not know what form of table the committee would have or what it would convey. A table showing the weight in grains of a certain number of minims of liquid, and showing the volume in minims of a certain number of grains of the liquid, is of great practical use. But to show the volume in cubic centimeters of a certain quantity in grammes of any liquid, is far more valuable, because in the metric system there is a close relation between weight and volume, and hence the advantage.

THE SECRETARY.—This table I understand has been made by calculations from the specific gravity.

MR. OLDBERG.—Yes, sir; from the specific gravity.

THE SECRETARY.—There is a slight discrepancy, although it does not make any practical difference, whether the weight of liquids is compared with water at sixty or at thirty-nine degrees. At 60° F. one thousand cubic centimeters of distilled water do not weigh quite one thousand grammes.

MR. OLDBERG.—It weighs 998.9.

THE SECRETARY.—So near 1000 that it is practically the same.

Mr. Menninger read a paper by Mr. Lloyd on precipitates in fluid extracts. (See page 336). The paper is in continuation of others read at previous meetings. The subject was illustrated by various specimens and by drawings. The paper was referred for publication.

MR. RICE.—I was very much pleased with this paper. I think it contains some very important facts, that have been overlooked heretofore. We are familiar with the appearance of stock bottles, but very few have ever given any thought to the manner in which the deposit was formed on the bottle. We were under the impression that we could succeed in preserving our liquids undecomposed for any length of time, but Prof. Lloyd tells us we cannot even do that. I think that he is on the track of some new discoveries in science that will prove to be of importance, and which in the end will explain phenomena, hitherto little understood. I am sure this is not the end. He seems to have crept over into other channels, which I hope he will give us next year. His last experiment as to the amount of iodide of potassium found on the sides of the bottle from the alcohol solution, shows a much larger amount of solid than the alcohol could dissolve, and which would require about one-fourth more than the entire amount of alcohol in the bottle; this proves that the deposit was not merely from continued evaporation on the surface, but that a resolution of the substance below took place. It is likely that the same must happen with our tinctures.

MR. SHINN.—I would like to ask Prof. Lloyd if the pharmaceutical moral is not largely conveyed in three words, "Shake the bottle?"

MR. LLOYD.—You might have to shake the bottle pretty hard sometimes to prevent the difficulty.

MR. HALLBERG.—I think one matter has been lost sight of—the effect of light upon the drug, and upon the concentrated solutions. Certain preparations, more especially the concentrated fluid extracts containing chlorophyll and tannic acid, are liable to precipitation when exposed to the light, either the direct or indirect sunlight; but when they are put in bottles of flint glass and kept in a comparatively temperate, dark place they do not change so readily. I think that that has a great deal to do with the preservation of the solutions of vegetable drugs.

MR. ZIEGLER.—In reference to saturated solutions of liquids, I can readily understand what would precipitate a portion. It seems to me that in a vessel nearly full of liquid reasonably well secured, the alcohol that had filled the vacant space, on a change of temperature, would condense, reunite with the menstruum, and redissolve what has been separated. It seems to me that these precipitates might be occasioned by some chemical change. I think that the gentleman who spoke last, intimated that it might be attributed to some changes occasioned by light. I do not often make close examinations of this kind; but I have been often worried and annoyed about it, and I have often thought that the change might be due to the action of light.

MR. REMINGTON.—It seems to me that the paper read last year at our meeting, which probably the gentleman has not had an opportunity of reading, together with the experiments which have been detailed to-day, show very conclusively that whilst in the case of simple substances, like many salts, which are capable of being dissolved readily, the condensed liquid would redissolve the salt, but in case of complex solutions decomposition takes places, changes go on, precipitates are bound to form on the sides of the bottle, and it is impossible to redissolve those precipitates.

MR. LLOYD.—When they get into this condition, it is impossible to redissolve. The term "a saturated tincture," is a very unfortunate term indeed.

Mr. Shinn read the report of the Committee appointed to consider the recommendations contained in the President's address, and in the report of the Entertainment Committee. The report offered the following resolutions:

First. On the continuance of the Committee on Membership.

Resolved, That the Committee on Membership be appointed by the Council.

Second. President Heinitsh recommends the passage by Congress of a national pharmacy act to make a more uniform code of laws for all States.

Resolved, That this important subject be referred to the Committee on Legislation, for its consideration, with power to memorialize Congress if it sees fit.

Third. The President recommends that another effort be made to elevate the condition of apothecaries in the army and navy.

Resolved, That this Association directs the Committee on Legislation to continue efforts already made in this direction.

Fourth. The sending of delegates to the International Congress to be held next year in the city of Brussels.

Resolved, That the Council be empowered to nominate suitable delegates to represent this Association in the International Congress of Brussels.

Fifth. The sale by Government of drugs and medicines that had been condemned by the drug examiners.

Resolved, That the American Pharmaceutical Association protests against this reprehensible practice, and recommends the Council to take such action in the matter as may best carry out the wishes of the Association.

Sixth. The President suggests that the subject and character of our entertaiment, and the time of holding the sessions at the annual meetings, and the manner of providing for the same, be referred to the Council for supervision and direction.

Resolved, That the Committee of Arrangements and Entertainments be appointed by the Council, who shall supervise and ratify the final arrangements of said committee as part of their official duties as provided in Section I., Article 6, of the By-Laws.

Vice-President Rice occupied the chair.

On motion of Mr. Kennedy, the report was accepted and the resolutions taken up *seriatim.*

The first, second, third and fourth resolutions were adopted without further discussion, and the fifth resolution was read.

THE SECRETARY.—Mr. President, I do not know whether my information is perhaps not perfectly clear on this subject. I thought that the drugs condemned by the drug examiners had either to be re-exported or burned. I believe the subject-matter of the resolution has reference to something else—possibly to the condemned drugs that were in the hospital service of the army and navy.

MR. MENNINGER.—There is another case where drugs have not been condemned for inferior quality, but where the quality has been changed, or where a portion of the drug has been damaged in transit.

THE SECRETARY.—I am perfectly willing it should pass if it is understood.

The fifth resolution was then adopted.

The sixth resolution being read, President Thompson (on the floor) offered the following amendment to it.

Resolved, That the Council be also authorized to accept or reject any invitation that may be extended to the Association for its entertainment during the time of meeting.

MR. THOMPSON.—One object in offering this amendment is that the Council may have the power to limit the extent of voluntary entertainment which may be offered at any place where the Association may meet. This will also prevent the people from actually over-burdening themselves with any attempt at entertaining the Association.

The amendment was accepted by the Committee, and the resolution as amended was then adopted.

The Committee further offered a resolution recognizing the labor performed by the Entertainment Committee, and referring the recommendations of the latter to the Council. This resolution was likewise adopted.

A motion to adjourn was made, but by request withdrawn.

President Thompson (on the floor). We are largely indebted for the very ample accommodations afforded us, and the place of meeting, to the personal influence of Prof. Baird, of the Smithsonian Institute. The Professor also took considerable interest in this meeting, and expected to be here at the time. The museum contains a collection of materia medica specimens, which it is the desire to make the most complete in the United States. Professor Baird claims that it belongs to no school, and is open at all times to the public; and he is anxious to interest the Association in the perfection of that collection, and has offered that anything that the Association may send there, may be designated as the collection of the American Pharmaceutical Association. Indeed, I understood him to say that he was perfectly willing to give the whole collection, if this Association would assume charge of it and use its influence to perfect it. Doctor Flint, the curator of this part of the building, in charge of the collection, expected to have a full catalogue printed, to distribute among the members of this meeting, and may yet have it ready to-morrow. Now with the end stated in view, Mr. President, I offer the following resolution to carry out the object of Prof. Baird:

Resolved, That the National Museum is hereby declared to be the depository of the specimens of the American Pharmaceutical Association; that all specimens of materia medica, chemistry, and pharmacy coming into the possession of this Association shall be deposited in said Museum, and be designated as the collection of American Pharmaceutical Association, and that our members are recommended to contribute towards the completion of the collection.

MR. REMINGTON.—I would like to make a suggestion to the mover of this resolution. It seems to me that in order to carry this into effect, it will be necessary to have somebody to supervise it and take charge of it. I suggest the appointment of a special committee to collect the material and turn it over. Without that, it seems to me that practically the resolution will be inoperative, because the American Pharmaceutical Association has no collection at present, and there is really nobody connected with the Association that has that matter in charge.

MR. THOMPSON.—That is a good suggestion, and I accept it as an amendment.

The resolution offered by Mr. Thompson, with the amendment added to it, "that a committee be appointed to receive specimens for this collection," was then adopted.

MR. VOGELER.—I would like to bring up a topic now that will occupy but a few minutes, quite germane to the previous discussion, and that is the matter of proper badges. At the present meeting there seems to be an unjust discrimination in the distribution of badges to the members of the Association. We were told yesterday in one report that one of the objects of this society should be the cultivation of sociability with older members of the society—that the older members of the Association should attempt to make it home like and pleasant for the new comer. I can see no better way of bringing about such a result than by labeling, as you might call it, in a proper manner the members of the Association, so that we can introduce one another without any undue ceremony. On two or three occasions in this city I have accosted people believing them to be members, and they were entire strangers. Such experience will make a person a little timid in attempting to scrape up further acquaintance, and especially the new-comers. To avoid similar difficulties I would offer the following resolution:

Resolved, That it be a standing order to the Committee on Arrangements to provide suitable inexpensive badges at each subsequent meeting, for all members in attendance.

MR. SLOAN.—I believe that the Association has a badge of its own, that each member can procure from the Secretary for a very small expense a permanent badge, which will last for an indefinite length of time. Each member can supply himself at any time.

MR. VOGELER.—Although such is the case, and although it might be sufficient to have such a badge, at the same time the outlay of procuring new badges each year is small, and most of us would like to retain these badges as souvenirs of the meetings we have attended.

On motion of the Secretary, this subject of providing badges for all members in attendance at future meetings was referred to the Council.

The Permanent Secretary stated the Council had examined the credentials of the following delegations:

Missouri State Pharmaceutical Association—A. R. Edmonds, F. W. Sennewald, H. M. Pettit, P. H. Franklin and J. T. Plunkett.

Rhode Island Pharmaceutical Association—H. J. Leith, H. J. Alfreds, and W. R. Greene.

The Association then adjourned until 3 o'clock in the afternoon.

FIFTH SESSION.—THURSDAY AFTERNOON, SEPTEMBER 13.

President Thompson called the Association to order at 3.30 o'clock. The minutes of the fourth session were read and approved.

The minutes of the Council were read by its Secretary, and report the following transactions:

The organization was effected as follows: *Chairman*, Jos. P. Remington; *Vice-Chairman*, C. L. Diehl; *Secretary*, G. W. Kennedy; *Committee on Membership*, G. W. Kennedy (chairman), J. Ingalls, H. J. Menninger, E. W. Runyon, F. H. Masi, C. A. Tufts, J. M. Maisch; *Finance Committee*, S. A. D. Sheppard (chairman), J. L. Lemberger, H. J. Menninger; *Publication Committee*, J. P. Remington (chairman), C. L. Diehl, Wm. Saunders, Chas. Rice, J. M. Maisch.

The arrangement made for the present meeting by the Committee on Papers, for furnishing copies of essays and reports to journals, was approved. On motion of Mr. Ebert it was

Resolved, That hereafter a committee be appointed consisting of three members of the Council who are not connected with the publication of any pharmaceutical journal; said committee to take charge of all papers read before the Association, and when called upon to furnish copies for publication at the cost of copying the same.

On motion of Messrs. Maisch and Rice it was

Resolved, That, commencing with next year, the report on credentials published in the proceedings, shall contain only the names of bodies accrediting delegates; and that the delegates present at the meeting be indicated in the list of members present at the meeting.

Applications for membership were examined and referred to the Association, and the following new members were elected since the last report:

District of Columbia.

Oscar H. Coumbe, Washington.
C. H. Fickling, West Washington.
George B. Lockhart, West Washington.
John C. Martin, Washington.
Arthur Nattans, Washington.
J. Eagan Short, Washington.
Thomas McAleer Wehrly, Washington.

Indiana.

James McCaffrey, Cambridge City, Wayne county.

Kentucky.

Phil Fischer, Louisville.
Fred J. Renz, Louisville.

Louisiana.

Francis Gouaux, Houma.

Maryland.

William F. Edwards, Baltimore.
Isaac E. Emerson, Baltimore.
John J. Thomsen, jr., Baltimore.
William E. Thornton, Baltimore.

Massachusetts.

Charles B. Emerson, Haverhill.
George Theo. Scott, Worcester.

Mississippi.

John P. Finlay, Greenville.
Howell Forman West, Fayette.

Missouri.

William Young, Red Hill.

New York.

George L. Peck, Jamaica.

Ohio.

Samuel W. Carpenter, Delhi.
Ralph L. Cobb, Cleveland.
George J. Karb, Columbus.

Pennsylvania.

Edward Zeigler Gross, Harrisburg.
Lucius Elmer Sayre, Philadelphia.
Mathias M. Schneider, Pittsburgh.
William M. Thomson, Philadelphia.
Albert H. Wilson, Pittsburgh.

Texas.

Walter Blackburn King, Waco.

Virginia.

Henry A. Wiseman, Danville.

West Virginia.

A. N. Williams, Parkersburg.

Wisconsin.

Chas. R. Bechman, Fountain City.

Mr. Gordon, chairman of the Committee on Exhibits, made a verbal report, and requested further time for completing the report after the final adjournment of the Association. The request was granted.

Mr. Gordon read a paper on "The Production of Bromine in the United States" (see page 366), which was accepted and referred.

A paper was next read by Mr. Kennedy on the asserted presence of magnesium sulphate in certain lots of "Commercial Sulphate of Cinchonidine" (see page 383). The salt of American manufacture was found to be free from this impurity.

Mr. W. W. Bartlet read a paper on "Stathmetometric Analysis" (see page 391), in answer to query 26; and Prof. Markoe read a paper by Mr. A. B. Taylor, on the same subject, entitled "Stathmetic Estimation" (see page 393). Both papers were referred.

MR. RICE.—When the Pharmacopœia Committee had under consideration the introduction of the volumetric method, the stathmetometric method was likewise discussed; but, after mature deliberation, the former alone was introduced. There was no special opposition to the stathmetometric method. We were aware that it had several supposed advantages over the volumetric method; yet, as far as accuracy is concerned, we held that the latter had the preference. It is quite true that measure or volume is affected by temperature. When we make a solution, say of oxalic acid at the summer temperature —supposing at 90 degrees F.—and at the same time a solution of permanganate of potassium so as to be equivalent to it, and we then set them aside until winter or at once cool them to a low temperature, we will find that they still practically correspond to each other, measure for measure. There is indeed a very slight difference, inasmuch as each solution contains different quantities of solids, and the ratio of expansion is not absolutely identical. Yet this difference is so small that, unless the utmost accuracy is required, it is generally disregarded by analysts. Now as to the advantages of the volumetric method: In the first place there is only one preliminary weighing required, namely, in making up the stock of volumetric solution. Once made, the solution will serve for many analyses in succession. In the actual analysis itself, as a rule, there is also but one weighing required, namely, the quantity of substance to be tested. If, however, the substance to be tested is a solution, and a definite volume of it is to be taken, this must, of course, be measured at the same temperature at which the test-solution happens to be at that time, say at the ordinary temperature of the room. On the other hand, in the stathmethometric method, the test-solution is poured into a suitable bottle, or a small, flat-bottomed flask drawn out near the top, and having a lateral curved dropping tube attached, to pour the liquid from, and this bottle weighed. Next the substance to be tested is weighed. The test solution in the flask is now carefully added until the reaction is completed. Some time must often be allowed for this, during which the flask is perhaps set aside; and, unless great care is taken, it may happen that some drops are lost from the orifice of the dropping neck, which loss may amount to so much as to vitiate the result. In practiced hands, indeed, this is not likely to happen, but it is a common occurrence in the hands of an average worker. Finally, the flask must again be weighed very accurately in order to ascertain the weight of the test-solution consumed, from which the result is then calculated. In every stathmetometric analysis, therefore, we need at least three weighings, while in the volumetric (if the solution is already made) we have but one. The scales commonly met with in the shops are not accurate enough to be reliable when small quantities and fractions of grains are to be indicated with certainty. These considerations induced us to adopt the volumetric method. We do not condemn the other; in fact, some members of the committee voted in favor of it; and it might be added that, if used with care, it is the best and most simple process in the hands of those who cannot procure accurate burettes or other volumetric measures. Any gentleman residing in distant States or Territories, for instance, who does not care to run the risk of having such apparatus shipped or sent to him from the East, can easily make the stathmetometric apparatus for himself, and make the analysis by it; but it consumes a good deal more time.

MR. DAVENPORT.—Dr. Rice has mentioned some difficulties, but there are difficulties in the volumetric method which he has not mentioned. The difficulty of losing a drop or two of the test solution can be overcome by using a different kind of bottle. It is true that there is more time consumed in the weighing; but if you wish equal accuracy you must also take the time into consideration for determining the condition of the volumetric apparatus, which will take more time. You cannot omit doing this if you wish to be accurate. You cannot buy a volumetric apparatus which you can rely on; you have to take your time to ascertain the accuracy of that apparatus, not only as to the accuracy of your burette, but as to all the volumetric apparatus corresponding with each other, so that you have equal multiples. Such are the various difficulties which. if not regarded, make the volumetric method seemingly most easy, though if equal accuracy is to be attained, it is really more difficult I think.

MR. RICE.—It is true what Prof. Davenport mentioned about the apparent difficulty in the volumetric method, and as to accuracy of the volumetric measures; but, at the present time, the trouble is not nearly as great as supposed. I know that there have been burettes sold in the market, only a few years ago, which were very inaccurate. If you were to use two burettes, side by side, and you were to measure those burettes exactly with mercury, you would find a difference sometimes, in fifty cubic centimeters, of from one-quarter to one-half a cubic centimeter—which is a very great amount—so that it rendered more care necessary in the use of the burettes. I believe the burettes are now more accurately made. In the first place, they are very well adjusted in diameter, and the graduations are made, not by a sort of rule of thumb, as they used to be, but by actual measure; and there is very little difficulty of obtaining accurate burettes at the present time. Of course, I do not deny the usefulness of the stathmetometric process; but we could not adopt it, because we did not, upon full consideration, regard it as accurate and as reliable as the volumetric.

MR. BARTLET.—It would seem to me that any method by which we brought any substance up to be weighed rather than to be measured would be more accurate. That would seem to be the opinion of the Committee of Revision when they made the Pharmacopœia. In making ready all our preparations we were obliged to weigh, because they thought this the more accurate plan. It seems peculiar that in making syrup of sarsaparilla we must bring that up to a certain weight, while in making a careful analysis of something which contains, for instance, arsenic, we measure with impunity. Any one who has worked much with volumetric analysis can see at once that from the time they begin until they finish an analysis, by this method, it must be a much shorter operation. No account is paid to temperature whatever. Your standard solution may be made up at that time, and you have no correction as to burettes or other apparatus. As to accurate scales and weights, every pharmacist should have them in his store. Scales should be sensitive to at least one milligram—that is a very small fraction of a grain—but my experience, gained in working in this matter, has shown me that they are much more accurate.

MR. RICE.—I don't wish to take up the time of the Association with mere remarks of my own on this subject. I feel that I must answer one remark of Prof. Bartlet. He asked why, when the Pharmacopœia was revised, measuring was abandoned and weighing substituted. He cites the argument that, for pharmacopœial purposes, weighing was more accurate than measuring; and he, therefore, concludes that the system of parts by weight should also have been applied to the pharmacopœial tests. That argument is fallacious. In order to make up pharmacopœial preparations to a definite weight, you obtain greater accuracy than by measuring, because a difference of five or six grains will be indicated on the scale, and the difference of five or six minims will never show in volume. In volumetric analysis we do not care for the temperature, as I mentioned a few moments ago—except in very particular cases—so long as the volumetric solutions and the substance to be tested (if it was a liquid and had to be measured out for the analysis) were at the same temperature. This is a different argument, and would be an argument to invalidate the claim of Prof. Bartlet—I wish you to keep this in mind—as to the accuracy of the scales. It might be said that if the scales are not accurate enough for analysis, the same scales are not quite accurate enough to weigh out the original quantity which is necessary to make your test solutions; but it is not quite so. There is but little force to that argument, since you do not weigh two or three grains to make a liter of test solution. Of course, weighing a large quantity at a time, the slight error of the scale disappears.

MR. MARKOE.—I do not know of any analytical chemist who has much work to do who uses the stathmetometric process; the best of our chemists are the ones least inclined to do so. Experience will demonstrate the value of the other method. I have tried both methods, and I would not go back to the other. There is one practical point with regard to the temperature. Chemists generally keep their solutions at a practically low temperature, so that the interference through a materially different temperature, of which mention has been made, hardly takes place. In reference to scales, I would say that pharmacists can possess no better scales than those made by Becker and Palmer, yet they never claim to indicate nearer than a milligramme, and after use they are apt to indicate even less than that; but the error in making test solutions would be very small. An error of one milligramme, in using small quantities for stathmetometric testing, may not be large enough to invalidate the results; even with solutions the normal error will be very slight indeed. On this point I would like Prof. Parsons' opi ion.

MR. BARTLET.—I wish to add but one word here, although I have spoken a good deal on the subject. The gentlemen seem to think that this error of temperature is of little or no account. Mr. Sutton in his work on volumetric analysis has devoted no less than three or four pages to that very subject, and gives a variation of results from the different temperatures. There is but very little written on the subject of stathmetometric analysis. I read over all I could find in English, and found very little mention of it. Attention was called to it in a very meagre way in Hager's Pharmaceutical Practice. I think that the opposition to this method is more from a lack of experience. If the gentleman had used it as long as some others, or had used it at all, it seems to me he would have more appreciation of it.

MR. PARSONS.—I could not take in all that Mr. Markoe said, but I thought that he was speaking in favor of volumetric analysis. The practice of those chemists who have got enough work to do, ought to weigh for something in this matter. Of course no one denies that some scales, used with great care in this stathmetometric process, will give accurate results; but I think the errors accruing from slight difference in temperature—the great differences so called—have been somewhat over-estimated. It has been my lot to make analyses by both methods, and analyses where the greatest accuracy was required, as in salt works and such places. I have found that the apparatus which is purchasable in the New York market, with ordinary attention to temperature is very good. Care should be taken not to put your apparatus near a steam bath or very near a glacier. As great accuracy can be obtained by the volumetric method as by the stathmetometric method. One difficulty is the determination of the end reaction by the volumetric as well as by the stathmetometric method, but a great deal comes by practice. A good process in good hands will give good results; and a rather faulty process in good hands, well carried out, will often give better results than a perfect process in the hands of an inferior analyzer. So it really comes down to the matter of personal skill as well as the delicacy of the process. I believe the volumetric process is by far the most expeditious, and by far the most practicable. That has been my experience.

Mr. Kennedy read a volunteer paper by Mr. Chas. K. Gallagher, on "The Mashing, Fermenting and Distilling of Grain into Whisky" (see page 375), which was accepted and referred for publication.

Mr. EBERT.—The gentleman has certainly given us an interesting outline of the manufacture of whisky, which, when published in our proceedings, will give us a fair idea of how whisky is made. The use of the permanganate of potassium some fifteen years ago was considered as a secret in the rectification of high wines. It is true that amylic alcohol is present in the high wines, and the salt is quite frequently used by distillers in their mashes, and also afterwards in the rectification of their spirits. In listening to the paper, the thought struck me that it might be possible, if we ever wanted to make whisky on a small scale, so as not to bring us in conflict with the internal revenue laws, that we might treat the high wines with permanganate of potassium and re-distill them. A number of years ago there was a spirit in the market called imported spirit, which pretended to come from Montreal, and was also known under the name of Montreal whisky. The claim for the spirit was that it did not contain any fusel oil, and no doubt it did not. It was a whisky as generally prepared in this market; and I think large quantities of it were prepared, because it had some reputation. The high wines were treated by permanganate of potassium. It could not be recognized by the smell or taste as differing from pure cologne spirit reduced with water. It was nearly absolutely pure alcohol and water, or diluted alcohol. It had, however, this advantage, that by standing, and getting some age, it gradually acquired a kind of etherial flavor or bouquet, as it is styled, which made it very pleasant. It struck me that we might make a whisky in this way on a small scale, and that this would not interfere at all with the internal revenue law. Such a spirit and liquor would be very valuable for the use of families. It is true, as the writer says, that the whiskies generally sold are merely the result of distillation from ordinary corn, the flavor of which is not as fine as when a large percentage of the small malted grain, such as barley, oats and rye, is mixed with corn. This produces what is generally styled old Bourbon whisky or rye whisky. I do not think that liquors should be slighted as they generally are in our business. We purchase of Tom, Dick and Harry, liquors without knowing what they consist of, and of what they are made, and we usually pay exorbitant prices for what we might produce ourselves. If we examine the liquors we receive from compounders, we will find that they are nothing else than mixtures of high wines, artificially flavored, and sold at high prices. I do not make these statements, gentlemen, as a man who knows much about liquors. My trade in such has always been very limited. I have made it an object not to sell any more liquor than I could possiby help—I have had to sell some. In an experience of fifteen or twenty years I have had considerable to do with the distilling and brewing business, and have made a large number of chemical examinations in that line. I also have visited very frequently the distilleries in Peoria and Chicago, where the interest is very large. I am familiar with many of the secret processes for getting a large yield, and know pretty much how to make whisky, although I have never made any. I have often thought it would do no harm if we would give attention to this matter as long as we handle these goods, instead of buying them blindly as we do.

MR. WELLS, of Cinncinnati.—About thirty-five years ago, a large distiller in Cincinnati discovered a process of refining whisky by redistilling with unslaked lime, to extract the fusel oil. The whisky thus made had a very large sale in the East. The process extracted the fusel oil almost entirely, and the whisky was acceptable to those parties who objected to the fusel oil. The majority of whisky drinkers—those who take old Bourbon whisky—do not desire this whisky; they want the fusel oil in it.

MR. EBERT.—In the manufacture of whisky sulphuric acid is sometimes used. The yield is not much greater than when the grain is properly mashed and properly proceeded with, and the spirit is what is called very raw. It becomes so raw that it cannot be sold for good whisky. The use of sulphuric acid has been generally abandoned, except for very low grades of alcohol.

There is now a process used in large distilleries, which produces a very large yield —larger than formerly. It consists in this, that the starch in the grain after the mash is made is converted into a saccharine body, by the use of what is called pressure converters. That is, the mash is run into a large, strong vessel, usually in the shape of a high cylinder, and generally made of copper. By means of steam, a pressure of from eighty to one hundred pounds is put on, and in that way all the starch is cooked, as it is called; the vessels are the cookers. In this way the manufacturers get a much larger yield of alcohol than they formerly did.

Mr. Wells.—In reference to my statement, I should have said that when whisky is redistilled the second time, the lime was used. Of course it was not pure in the first mash. Another process has been considerably experimented upon by passing electricity through whisky, in order to have the fusel oil oxydized or altered. A number of parties are experimenting on that subject, and hope to accomplish some good results in that way. I don't know whether they will succeed or not.

Mr. Ebert.—In relation to that I would say that a French patent has been taken out for the purpose of oxydizing amylic alcohol by electricity. This invention really belongs to America. I happen to know the facts in the matter. The electrician of the Chicago Fire Department, just after the fire in 1871, with the Fire Marshal, came to me to consult me about this very subject. They brought to me an alcohol which had been thus treated, and another that was the ordinary alcohol of commerce, and they asked me if I could test both for the amount of fusel oil. At that time, as I was very busy, and could not give them any attention, I told them the quickest way for them was to make a practical test of this subject, and take it to men who were in that business, and likely they would get better information than I could give them. They really had used this process, and brought it to great perfection, but unfortunately it seems they had not taken out a patent at the time, as they intended to to. Only recently I have seen that a patent has been taken out in France, and re-issued in this country.

Mr. Prescott.—I think that the fact of the oxidation of the fusel oil by permanganate or any other oxidizing agent, has been over-estimated; and believe that fusel oil is best removed by fractional distillation, with the return of the condensed vapor, so as to best secure a good separation by one distillation. The next process is a means of getting rid of the fusel oil, which has already been mentioned, by treatment with vegetable charcoal. There is no doubt but that methyl alcohol is oxidized more rapidly than ethyl alcohol. The removal of amyl alcohol is pretended to be done approximately by permanganate of potassium, but it is accomplished only in a slight degree, as far as I can judge from some practical examinations, and from the reports of others. We hear that whisky or distilled spirit which is raw and harsh, has a reputation of being rich in fusel oil; it owes very much of its offensive odor and flavor to certain empyreumatic products, which are oxidized by the permanganate of potassium, or any other oxidizing agent; and it is assumed because you fail to get these irritating odors, that you have gotten rid of the fusel oil. As far as any analysis goes which I have been able to make, or to learn of, it might appear that the absolute quantity of fusel oil in any of the liquors, German liquors, or even the Bourbon, does not go over a small fraction of one per cent. The actual quantity is not as large as has been supposed.

Mr. Remington read a volunteer paper by Mr. Wm. M. Thomson, on an improved process for the manufacture of fluid extracts on a large scale. (See page 346). The paper was accepted and referred. The apparatus described in the paper was illustrated by a large drawing, showing the different parts, and the manner in which they are connected.

MR. HALLBERG.—This is substantially the process which has been used a number of years ago. I would also remark that prominent manufacturing concerns claim to take advantage of producing a vacuum in the drug, before the menstruum is allowed to come in contact with it, and then macerate it under hydraulic pressure. This is the apparatus they use, and it has been used for several years for manufacturing purposes.

MR. REMINGTON.—I have no doubt, in fact I know, that some of the principles which have been shown in this apparatus of Mr. Thomson's, have been in use, and have been applied to various forms of apparatus mentioned in text-books. This is undoubedly true; but Mr. Thomson has in his apparatus, I think, succeeded in making use of pressure, in producing a vacuum, and in furnishing a very complete apparatus—much more complete than any other that has been described, or with which I am familiar.

MR. EBERT.—I am sorry that the author of that paper did not give us some practical instruction in regard to the manufacture of the apparatus itself. He speaks of a pressure of three or four atmospheres; he should also have stated of what the apparatus should be made, and what kind of air-pump to use. It is all well enough to say, "Do so and so," to men who are mechanics, and who know sufficient about preparing such apparatus; but it would not have done any harm to have given some practical information, and to have described what strength of copper or iron should be used, and what kind of air-pump he found valuable.

MR. REMINGTON.—For information, I would say that in the volume of Proceedings for 1882, on page 34, there will be found an abstract of a paper, with figures and a description of an air-pump that he uses, and giving all the necessary points. The apparatus is made of copper, and it would not have done harm, to be sure, to have repeated this information: but he has already published it.

MR. HALLBERG.—If a drug is not thoroughly exhausted by the first percolation, the apparatus might be reversed, when the upper chamber would become the receiver.

The President appointed the following Committee on Specimens for the National Museum: J. A. Milburn, Washington, D. C.; H. B. Parsons, New York; and Joseph Roberts, Baltimore.

Mr. Sloan read a paper in inswer to Query 2, On the Keeping Qualities of Snow-water (see page 333).

Mr. Remington called up for action the proposed amendments to the By-laws lying over from the last session of 1882, the first one being:

Add to Chapter VIII, Article 4, the following: If the name of a member be dropped from the roll for non-payment of dues, the name of said member may be added again to the roll by the Permanent Secretary, on notification by the Treasurer that his dues have been paid for the three years during which his name remained on the roll.

The subject was discussed by Messrs. Maisch, Ebert, Baker, Painter, Cowdrey and Roberts, and the amendment was lost by a vote of 35 ayes to 12 nays—not three-fourths of the members voting in favor of it.

The second amendment lying over, was the following:

Add to Chapter VIII, Article 6, the following: Provided that the provision of this Article shall not be so construed as to reinstate any member whose name may have been dropped from the roll for non-payment of dues; nor shall any one, who has been expelled from the Association, be received as a delegate.

The amendment was adopted by a vote of 42 ayes to 1 nay.

Mr. J. W. Colcord offered the following:

Resolved, That a Committee of ten on unofficinal formulas be appointed to arrange such formulas as would be of practical benefit to the pharmacists of the country, to be known as the unofficinal formulas of the American Pharmaceutical Association.

Mr. Vogeler suggested, as an amendment, that this Committee consist of those members of the Committee of Revision of the Pharmacopœia, who are members of this Association.

The amendment was discussed by Messrs. Rice, Parsons, Wells and others, and was then withdrawn, after which the original motion was adopted.

Mr. Kennedy read the following preamble and resolution:

WHEREAS, The object of the repeal of the law imposing stamp duties on proprietary and patent medicines being to relieve the people of a tax no longer made necessary, and to benefit the consumer, who *alone* paid it;

AND WHEREAS, Manufacturers of patent medicines, with but few exceptions, have refused to abate prices, thus debarring the consumer of an advantage to which he is justly entitled; therefore, be it

Resolved, As the sense of this Association, that such refusal is in its action unwise and impolitic, an act of injustice to the people, and of bad faith to the government.

Mr. Doliber moved that the motion be indefinitely postponed.

This was seconded and carried by a vote of 26 ayes to 20 nays.

Mr. Ebert read the following report:*

The Committee on Time and Place of Next Meeting respectfully report, that it has been eight years since the Association met in New England, and ten years since it has met in the northern part of the Western States. Both Newport, R. I., and Milwaukee, Wis., have been suggested for the place of our next meeting, and the Committee recommend that when this Association adjourns it do so to meet in Milwaukee, Wis., on the third Tuesday in August, 1884.

JAMES T. SHINN,
JOHN INGALLS,
ALBERT E. EBERT,
Committee.

The report was accepted, and, on motion of Mr. Saunders, it was amended by substituting the second Tuesday of September for the third Tuesday in August, as the time for holding the next meeting.

Mr. Markoe moved to further amend by substituting Lake George for Milwaukee as the place for the meeting of 1884.

This amendment was lost, and the report as amended was then adopted.

The Association then adjourned until Friday morning at 9 o'clock.

SIXTH SESSION—FRIDAY MORNING, SEPTEMBER 14.

The meeting was called to order by President Thompson at 9.45 a. m.

The Permanent Secretary read the minutes of the fifth session, which were, on motion, approved.

The minutes of the Council were read by the Secretary and were approved. They report the following:

The salary of the reporter on the Progress of Pharmacy was fixed at $500 for the ensuing year. An order for $100, in payment for stenographic report, was directed to be drawn.

The resignation tendered by Guilford T. Chamberlain, of St. Louis, a member of the Association since 1853, was not accepted. His name was directed to be placed on the list of life members.

Applications for complimentary copies of Proceedings, and the list of societies receiving such complimentary copies were referred to the Publication Committee, with power to act.

The Ebert prize awarded at this meeting was directed to be a medal, in place of the available sum of money, and the chairman of the Council was requested to have it prepared.

The Auditing Committee's report was accepted as follows:

We certify that we have this day examined the accounts and vouchers of Chas. A. Tufts, Treasurer, that we have also counted the bonds, and find the amount of the same to correspond with his account thereof.

JOS. L. LEMBERGER,
H. J. MENNINGER.

Washington, D. C., Sept. 12, 1883.

On motion of Messrs. Rice and Tufts, the chairman of Council was requested hereafter to post in a conspicuous part of the meeting room a card notifying the members of the next meeting of the Council.

The following members have been elected by the Council:

George W. Boyd, Washington, D. C.
W. C. Milburn, Washington, D. C.
Talbot C. Murray, Washington, D. C.
Napoleon Wooldridge, Cedar Key, Fla.
Chambers B. Clapp, Chicago, Ill.
Horace Burrough, Baltimore, Md.
S. Douglas Smith, Reading, Pa.

The applications of three candidates were examined, and directed to be reported to the Association.

Mr. Tufts, chairman of the Nominating Committee, on behalf of this Committee, nominated Mr. John R. Drake, of Milwaukee, as local secretary for the ensuing year.

On motion of Mr. Shinn, the Permanent Secretary was directed to deposit an affirmative ballot for the nominee, which having been done, Mr. Drake was declared elected.*

Mr. Ebert moved the reconsideration of the vote by which the time of the next meeting was fixed for the second Tuesday of September, so as enable him to move that the meeting be held on the last Tuesday in August. The motion was seconded by Mr. Vogeler.

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* Mr. Drake was duly informed of his election; and, being unable to act, resigned. At a meeting of the Council held in December, 1883, his resignation was accepted, and Mr. Henry C. Schrank was elected Local Secretary, who accepted the position.—PERMANENT SECRETARY.

MR. REMINGTON.—Gentlemen, I hope this will be voted down. We have, after a very full and free discussion here, decided that the second week in September suited the greater majority of members. There has been no argument brought before the Association to show that the ordinarily hotter weather in August would be of any advantage for the Association, or that it would gain any advantage by going earlier. We ought to take that into consideration, and also the convenience of the greatest number of members. The summer time is a very bad time to meet, especially the second week in August, as it is oftentimes the hottest weather which we have during the whole summer. Other things being equal, I think we ought to go at a time when we are generally sure of having cooler weather. Besides that, there are meetings of other scientific associations which would prevent the members from attending.

MR. SLOAN.—I heartily agree with Mr. Remington in one statement that he makes, that we should consider the convenience of the greatest number of members. It is a fact that in the summer months the people are out of town seeking recreation, and they generally get back home about the 1st of September. This date in our part of the country is the busiest time of the year. It is not, as a rule, any warmer in the last week of August than it is in the first week of September. Again, as Mr. Ebert said yesterday, all through Indiana, Ohio and Illinois, and the other states, a majority of the druggists are very busy. Out of a membership of fourteen hundred we would not have two hundred at the meeting. I believe it is worth trying once again, having an earlier meeting. We tried it two years ago in Kansas City; I will admit it was a failure there, but we had a season then that we have hardly once in a lifetime—I mean such exceptionally hot and dry weather. I believe one week or two weeks sooner will not make a great deal of difference to a few of the members, but it will make a great difference to a larger number.

MR. EBERT.—In further explanation, I would like to say that the States of Wisconsin and Minnesota are the great watering places of the Northwest; and if you will just make the time of the meeting a little earlier, it will be better. The Exposition is held in Milwaukeé about the second week in September; and at the same time all these people are going through Milwaukee on their way to their homes; they fill the hotels full, and it is then not as convenient as it would be about the last Tuesday in August, say about the 26th, when we shall be able to get possession of the Exposition Building, and in every way be better provided for. For these reasons I think the time should be changed.

THE SECRETARY.—I desire to ask further whether it is the intention to propose the middle of August or the latter part of August for holding the meeting.

MR. EBERT.—The latter part—it will be the 26th day of August.

THE PRESIDENT.—The last Tuesday in the month.

MR. COWDREY.—In regard to the meeting in Milwaukee, I stated yesterday that I did not favor the holding of the meeting there as late as September. My reason for doing so was that probably many members of the Association would like to meet in Chicago, and go up by boat on Lake Michigan to Milwaukee, which is directly north of Chicago, ninety miles, and have a sociable day as we did when we went from New York to Albany on the boat. An excursion of that kind could not take place as late as September, as the weather would be too cold in all probability. Another thing, if you meet there in September, you will have no exibition hall that would be proper and fit for the Association, because the building will be occupied by the Exposition.

MR. KENNEDY.—I wish to express no discourtesy to the mover of this motion, but we have a great deal of work to do here, and I do hope the discussion will not be continued any longer, as it only consumes time. I move to lay the motion of Mr. Ebert on the table.

The question being taken on Mr. Kennedy's motion, a division was called for, resulting in a tie vote of 19 ayes and 19 nays. The chair declared the motion to indefinitely postpone lost.

The motion of Mr. Ebert to reconsider was then carried by a vote of 24 ayes to 13 nays.

Mr. Ebert now moved, and it was seconded by several members, that the next meeting be held on the last Tuesday of August, 1884.

Mr. Menninger moved to amend by meeting at Newport, R. I.

This motion was ruled out of order, and the motion to meet on the last Tuesday of August was carried.

Mr. Wheeler read a paper on Citrate of Caffeine in answer to query 5 (see page 380), and in answer to a question by Mr. Shinn, stated that he had not made any experiments as to the solubility of the three varieties of Caffeine citrate.

Mr. Vogeler stated that it had become customary in Germany to dispense caffeine, when caffeine citrate was prescribed.

Mr. Remington read a volunteer paper entitled, Petrolatum in the Officinal Ointments (see page 351), which was referred for publication.

Vice President Rice occupied the chair.

MR. SLOAN.—Has Prof. Remington made any experiments looking towards substituting yellow wax by one of the harder paraffins? Wax is growing each year more and more scarce. The difficulty is to get it good and pure, from the manner of treating the bees. They are now stealing the honey from the bees without taking down the comb, and have gone so far as to make an artificial comb from paraffin. If that substitution could be made practicable it would be important to know it.

MR. REMINGTON.—I have very frequently attempted to incorporate paraffin with the petrolatum. Notwithstanding a great deal of care was used in stirring it, I never succeeded in getting a homogeneous product; it will be granular. The best results are obtained from yellow wax.

MR. R. W. GARDNER.—Is the gentleman familiar with the fact as to whether these products are as readily absorbed by the skin as animal fats?

MR. REMINGTON.—I think it has been shown by very ample experiments that substances which are incorporated with petrolatum are more readily absorbed.

MR. GARDNER.—I have heard that disputed.

MR. REMINGTON.—I know that it is disputed, but by no authority of any great weight.

MR. MENNINGER.—Have any experiments been made with reference to the relative melting point of the product furnished by the different manufacturers? I don't ask the name of the manufacturer, but simply whether the difference in the melting point of commercial petrolatum has been observed.

MR. REMINGTON.—Vaseline and cosmoline are made according to the old formula; but now manufacturers make a peculiar substance which they are advertising freely as petrolatum, which differs from the other articles mentioned. This petrolatum, so far as I have been able to examine, is very close to the officinal melting point. It is a special article with them. The exact melting point within a degree or so has yet to be determined. It is very difficult to ascertain the exact melting point of a substance like this, semi solid. You will find, I think, that if you order petrolatum from some manufacturers you will get an entirely different product from vaseline.

MR. GARDNER.—The oleates are better absorbed than almost any class of preparations. How do you reconcile that fact?

MR. REMINGTON.—The oleic acid has been proved to be the best possible base, and the oleates have been introduced into the Pharmacopœia with that view; but oleic acid and the oleates in the shape of fats are different compounds, just as different as the acid and the salt made from the acid. When you are speaking of oleic acid you are speaking of a different subject. The fats are compounds of oleic and stearic acid.

MR. GARDNER.—They are of a similar nature.

MR. REMINGTON.—Not at all. You may take lard oil, which is an oleate, and lard, which is a mixture of oleate and stearate, and when you extract the oleic acid, and use that as a base, you get an entirely different compound having different properties and constituents.

MR. VOGELER.—Which standard of petrolatum has been used; that fusing at 104 or 120 degrees?

MR. REMINGTON.—Melting at 104 degrees.

MR. GEORGE.—What Prof. Remington says is correct as far as my experience goes. I have made the petrolatum compounds. The oxide of zinc ointment, the sub acetate of lead ointment, and the unguentum aquæ rosæ made with petrolatum, or similar compounds, act well, but the ointments of cantharides, of nut-galls, of belladonna, and so on, made with petrolatum, our physicians report, are far inferior to those made with lard or according to the officinal process, simply because they find that the ointments are not absorbed, but the whole surface remains covered by the ointment. Some go so far as to say that the pores of the skin are entirely closed by the cosmoline compound, so that the remedy cannot be absorbed. The other ointments with lead and so on act very nicely, better than when the ointment is made according to the officinal process.

MR. LEO ELIEL.—While I have had good results with most of these ointments, it has been claimed that petrolatum develops the odor of iodine in a very objectionable manner. I don't know whether it is the action of petrolatum on the iodine that does that, or what change takes place after the ointment has been made for a certain length of time.

MR. REMINGTON —Iodine ointment made with petrolatum is of a greenish black color and very different from the officinal. I do not recommend it. That would be an interesting subject for inquiry. I think from appearance it looks very much as if there was some decomposition, but I have not investigated it. If you examine it closely, you will find that there is also a difference in odor.

Mr. Cowdrey read a paper entitled "Who is Responsible for Adulteration?" (see page 362) which was referred for publication.

President Thompson occupied the chair and announced the following committee on unofficinal formulas: Jos. W. Colcord, Lynn, Mass., Chairman; Jas. T. Shinn, Philadelphia; N. Hynson Jennings, Baltimore; Chas. Becker, Washington; J. D. Wells, Cincinnati; S. A. D. Sheppard, Boston; A. Vogeler, Chicago; M. W. Alexander, St. Louis; Emlen Painter, San Francisco; and C. L. Keppler, New Orleans.

Mr. Kennedy read a volunteer paper by W. H. Thomson, entitled "Laboratory Notes" (see page 360), which was accepted and referred.

MR. EBERT.—I think the gentleman has presented to us a very valuable suggestion with regard to the use of hose. In sugar refineries a large number of gaskets are used, and the price is of importance. I have used these gaskets for the last eight or nine years, but the suggestion here is a new one, and, I think, highly valuable, and one to which we ought to give some attention. In the manufacture of sugar, we gain considerable practical experience in percolation, but it is on a very large scale. I feel satisfied with the experience I have had for the last ten years in the use of bone-black, where the percolation is continuous. It is a very faulty process, which cannot well be controlled. The moment that diagram of a percolator in sections was put there it presented an unusually suggestive feature. I believe the extraction could be done in that way much better than in any other way that has been suggested. The menstruum comes down from the first section there it is again all united. As fast as the liquid comes down it forms a layer, and again spreads all over the powder, and it will run through much more saturated than it run from the first. In the next section this will take place to a greater extent, and so on to the fourth; and eventually you will have a complete exhaustion of the drug. This certainly to me is one of the most interesting features of this meeting. I believe the suggestion is a valuable one, and I am highly delighted with it.

MR. LLOYD.—I use also a rubber pipe for gaskets; and instead of pressing it together I leave it as I find it. I bore holes in the the top of this pipe so that the screws will extend through it and screw into the percolator below, thus leaving the pipe round. When you put weight upon that it will be pressed together so as to form an air-tight joint, whereas, if the pipe was to be pressed flat, in this manner it would require considerable weight upon it to force it down.

MR. SHINN.—The point which Prof. Lloyd wished to enforce was that the weight of the cover will be sufficient to make an air-tight joint.

MR. REMINGTON.—I want to call attention to one possibly objectionable feature in sectional displacement. It is this: When you pour the menstruum into the top section, of course a large amount of it spreads over the top of the powder and passes through at once; when it comes to the second one this does not take place. If the percolator is not entirely plumb there is a liability that the liquid will drop over to one side, and thus percolate the different sections unevenly. There will be a want of uniformity. There might be some difficulty of exhausting the drug as thoroughly and carefully. Of course it would trickle down uniformly if the apparatus were perfectly plumb; but if otherwise you would have an unequal exhaustion. You must be sure that the liquid passes just as in ordinary percolation. It seems to me the idea is an excellent one.

MR. EBERT.—I would like to call Mr. Remington's attention to the fact that the menstruum after passing through the first section will accumulate and will not run down at once, so there will always be a layer of it. The liquid will run faster through the first than through the second section, and so on.

Mr. Sloan read a volunteer paper by Mr. Lloyd on Extract of Malt (see page 348), which was accepted and referred. In answer to a question by Mr. Ebert, Mr. Lloyd stated that the proposed fluid extract contained unaltered diastase.

MR. EBERT.—The question is as to the value of such a preparation. When diastase is taken into the stomach its effect is certainly destroyed there. Moreover this does not represent the extract of malt as generally understood; that is a saccharine solution of malt produced by the action of diastase upon starch, whereby this is converted into glucose. That is all that is claimed for extract of malt. Those gentlemen who find it necessary to leave diastase in their malt extract, have given us a new preparation for which they claim certain effects, which I think some physiological chemist had better investigate. My own opinion about this matter is that diastase taken into the stomach in this form has no effect whatever; it is destroyed in the stomach and has therefore no converting properties on the starch that may come into the stomach, because starch and fat are not assimilated in the stomach while the diastase is destroyed in the stomach itself. I published the first formula for extract of malt in this country. At that time it was only considered as having a single claim as being nothing else than a vehicle containing saccharine matter. Manufacturers are always making up something new, and so they have taken up this new theory of diastase. The only good that it has ever done or ever will do is to prevent pharmacists from making their own extracts of malt, and for this reason, that when the temperature of such a malt solution is heated above 158° F., (I think that is the temperature), the diastase is destroyed. Manufacturers have a convenient way for making the extract—they have adopted vacuum pans, and by this method it is made more cheaply than on a smaller scale. Therefore they now bring before us a plan so as to deter the dispensing pharmacist from making his own extract of malt, claiming something superior for their preparation, for we cannot each of us have a vacuum pan. When we come to evaporate this solution we will have to raise the temperature generally above 158°, and we thereby destroy the diastase for which they claim unusual qualities. That is simply a trick of the trade, gentlemen; that is to make business. It is one of those little things where we are sometimes gulled terribly on the subject.

MR. COWDREY.—Has Mr. Lloyd tested this extract of malt for diastase? I ask for this reason, that I have held the opinion that the extract of malt would not contain active diastase, and that it would not transform gelatinized starch after it had been in the presence of the alcohol.

MR. LLOYD.—I have found it a difficult thing to examine. The specimens are here, and can be examined very readily; or the members can make the preparations in the same manner.

MR. EBERT.—My remarks were not made in any way as a reflection upon the paper. My remarks were more for the purpose of directing attention to manufacturers. This preparation can be made by any pharmacist.

MR. LLOYD.—The intention was to bring before the meeting a process which could be used everywhere to obtain a product that would convert starch into sugar. If we are to understand that the extract of malt will convert starch into sugar, I would say it is worthless if it will not do it. Specimens heated to 180 degrees are valueless. I think that if a heat of 180 degrees is applied to the extract of malt, whether alcohol is present or not, it will destroy the diastase. If the starch is heated to 180 degrees, and then the malt is added, it will not convert the starch.

MR. SLOAN.—Mr. Lloyd intended to illustrate this paper by a series of experiments: but the late hour, and we being crowded for time, has led him to forego that. That is another evidence of the importance of having our business first and our pleasure afterwards.

Mr. Kennedy read a paper by Mr. J. H. Feemster on "Caffeine in Commercial Powdered Guarana," in answer to Query 48 (see page 396).

Mr. Lemberger read a volunteer paper by Mr. J. W. Colcord, entitled "Pharmaceutical Notes" (see page 358); and Mr. Remington read a paper by Mr. C. W. Phillips on "The Precipitate in Tincture of Boletus Laricis" (see page 400). These papers were accepted and referred for publication.

The following resolution offered by Mr. Shinn was adopted:

Resolved, That the sincere thanks of this Association be tendered to the officers who have so admirably performed their duties, and to the Council which has carried on a large part of the work of the Association so successfully.

Mr. Painter suggested that the Publication Committee endeavor to publish the Proceedings at as early a date as possible. The Permanent Secretary stated that for the past twenty years this had been endeavored by him, and while he had succeeded in materially reducing the time, and frequently had published large volumes in a much shorter period than heretofore, still there were vexatious causes of delay, which could not be appreciated by any one, unless he had some experience with the publication of similar volumes. Even the pamphlets published by the State Pharmaceutical Associations made their appearance frequently many months after their meetings. The main delay was usually caused by some of the reports and papers not being ready at the meeting.

Mr. Gordon stated that the National Wholesale Druggists' Association had appointed a committee to this meeting, but the Chairman being absent no credentials were presented. He moved that a committee of five be appointed to meet with that Association at its next annual meeting in New York.

The motion was adopted.

Mr. Lemberger offered the following resolutions;

Resolved, That the thanks of this Association are due and hereby tendered to Mr. Charles Becker, Local Secretary, and his co-laborers, the Local Committee, for the success attending this meeting, as we feel it largely due to their earnest efforts that we are so favorably located.

Resolved, That our thanks are due to the Committee on Entertainment for their attention to the wants of the Association and for the excellent railroad arrangements effected for the use of members and friends.

Resolved, That our thanks are tendered to the Regents of the Smithsonian Institution for the use of the National Museum building.

Inasmuch as the pleasure and comfort of the Association has been greatly promoted by the privilege of holding our sessions and exhibition in the Smithsonian Institution, on motion

Resolved, That our thanks are hereby tendered to Prof. F. W. True, acting Director of the National Museum, through whose courtesy and attention our sojourn is made pleasant.

Resolved, That our thanks are tendered to Dr. J. M. Flint, Superintendent of the Department of Materia Medica, for his untiring attention to members while visiting his department.

Resolved, That we heartily thank the press of this city for reports of this meeting.

Last but not least, mindful of the attention shown our ladies by the pharmacists of Washington and their ladies, we hereby tender our grateful acknowledgment of this excellent service so heartily rendered.

All these resolutions were adopted.

The following List of Queries for 1884 was handed in, and on motion referred for publication:

No. 1. What is the proportion of water of hydration in the quinine of commerce. A paper on the subject is desired.

Accepted by H. B. Parsons, New York.

2. The practicability of Kerner's Test.

Accepted by H. B. Parsons, New York.

3. Jequirity Seeds (Abrus Precatorius). A paper on the subject.

Accepted by T. Roberts Baker, Richmond, Va.

4. On Copalchi Bark.

Accepted by Prof. C. Gilbert Wheeler, Chicago.

5. A paper on the tests for Brucine in presence of Strychnine, and for Strychnine in presence of Brucine, is desirable. Also a plan for the perfect separation of the alkaloids.

Accepted by Prof. A. B. Prescott, Ann Arbor.

6. How does the present U. S. P. process for assaying opium compare with others as to accuracy in thoroughly exhausting the drug of morphine?

Accepted by Prof. Wm. W. Bartlet, Boston.

7. Can the present U. S. P. process for the preparation of diachylon ointment be improved upon? If so, suggest a better.

Accepted by Leo Eliel, South Bend, Ind.

8. What is the best method of preserving mucilage of acacia?

Accepted by Albert E. Ebert, Chicago.

9. In the preparation of the oleates, which produce the most satisfactory products, those made from oleic acid or those made from soap?

Accepted by C. S. Hallberg, Chicago.

10. Should lactate of iron have any odor?

Accepted by Prof. O. Oldberg, St. Louis.

11. An examination of the Spanish saffron of commerce.

Accepted by Prof. J. M. Maisch, Philadelphia.

12. What is used to adulterate yellow beeswax, and what is sometimes sold as yellow beeswax?

Accepted by Prof. Chas. Caspari, Jr., Baltimore.

13. Pharmacists often have the price of cream of tartar sold by grocers thrown up to

them as a standard of the value of this substance. What proportion of the cream of tartar sold by grocers will conform to the U. S. P., and also that sold by druggists?

Accepted by Geo. W. Kennedy, Pottsville, Pa.

14. Is the formula of our new Pharmacopœia for making solution of nitrate of iron satisfactory? Will the preparation keep?

Accepted by Prof. Oscar Oldberg, St. Louis.

15. Will the chloroform of commerce conform to the requirements of the U. S. P.?

Accepted by Prof. P. W. Bedford, New York.

16. Is pure oleic acid for the preparation of oleates equal to an acid which contains a portion of stearic acid?

Accepted by B. F. McIntyre, New York.

17. An essay on the medicated waters according to the Pharmacopœia of 1882 is desirable. What advantage, if any, has the new Pharmacopœia process for making them over those of the preceding Pharmacopœia? What position do pharmacists generally take in the matter?

Accepted by Robert H. Cowdrey, Chicago.

18. Is there a necessity for evaporating extract of malt to the consistence of a solid extract; and if so, what is the advantage?

Accepted by Albert E. Ebert, Chicago.

19. It is said that essential oil of mustard seed of the market consists of two kinds, one made from the seed and the other made artificially. Information on this subject is desired.

Accepted by Charles Rice, New York.

20. Is the sulphate of quinine imported into this country and sold in bulk equal to that of our manufacturers?

Accepted by M. N. Kline, Philadelphia.

21. To what extent does the iodine supply depend on the supply of kelp?

Continued to Prof. P. W. Bedford, New York.

22. Are commercial volatile oils adulterated to any extent? What is generally used as the adulterant?

Accepted by G. H. C. Klie, St. Louis, Mo.

23. Ethereal oil of male fern deposits a sediment. Is the sediment or the overlying oil the desirable portion?

Continued to Charles F. Hartwig, Chicago.

24. What proportion of the cinchona barks of commerce will answer the Pharmacopœial tests? Give particulars.

Continued to H. B. Parsons, New York.

25. Are the compound cathartic pills of commerce prepared in accordance with the Pharmacopœia?

Accepted by S. H. Stevens.

26. Lead plaster and other plasters of the United States Pharmacopœia become hard and brittle by keeping. How can their soft consistence, as when freshly made, be preserved?

Continued to Hugo W. C. Martin, Chicago.

27. It has been asserted that some pharmacists pay percentages to physicians who send prescriptions to their stores Is this true to any great extent? What is the feeling of the pharmacists of our country regarding the matter, and the feeling of physicians?

Continued to Hugo W. C. Martin, Chicago.

28. The alkaloid berberine is by some writers claimed to be nearly insoluble, while another claims it is freely soluble in water. This discrepancy in statements should be investigated.

Continued to O. Eberbach, Ann Arbor.

29. What is the chemical nature of the acrid principle of mezereon bark?

Continued to O. Eberbach, Ann Arbor.

30. Is brucine poisonous? Dr. Garrod has stated that it is not.

Accepted by Robert Bartholomew.

31. What is the nature of the crystalline precipitate which forms in tincture of Boletus Laricis?

Continued to C. W. Phillips, Cincinnati.

32. What menstruum is best adapted to extract and hold in solution the desirable principles of licorice root?

Continued to F. F. Prentice, Janesville, Wis.

33. Does the brucine of commerce contain strychnine? An examination of the brucine of commerce is desired.

Continued to S. A. D. Sheppard, Boston.

34. Good authority states that artificial salicylic acid is now used in making oil of wintergreen, and that this artificial oil is cheaper than the natural. To what extent is this true?

Accepted by Adolph W. Miller, Philadelphia.

35. What is the quality of the narcotic herbs of commerce?

Continued to E. S. Hallberg, Chicago.

36. To what extent, if at all, is it proper for physicians to specify in their prescriptions the particular make of preparations prescribed by them?

Accepted by Prof. Otto A. Wall, St. Louis.

37. Does oil of thyme made years ago contain a larger proportion of thymol than that of the present day?

Accepted by Prof. Joseph P. Remington, Philadelphia.

38. The source and supply of indigenous drugs?

Continued to C. B. Allaire, Peoria.

39. What should be the relations between wholesale druggists, manufacturing chemists, and pharmacists and dispensing pharmacists, as to the maintenance of proper standards of purity, quality and strength of medicinal substances.

Accepted by Prof. Oscar Oldberg, St. Louis.

40. Is it proper to prepare tinctures, wines, syrups, decoctions, infusions, etc., from fluid extracts; and if so, to what extent?

Accepted by Prof. Otto A. Wall, St. Louis.

41. Examine the bromide of potassium of commerce.

Accepted by Virgil Coblentz, Springfield, O.

42. A paper on sassafras camphor.

Accepted by S. A. D. Sheppard, Boston, Mass.

43. What is the quality of the belladonna leaves of commerce?

Accepted by B. F. McIntyre, New York.

44. The crystalline form of the white alkaloid of Hydrastis Canadensis.
Accepted by Virgil Coblentz, Springfield, O.

The Permanent Secretary read the Minutes of the Sixth Session, which were approved.

The President expressed his thanks to the members for their kindness, and his hope of meeting them all in Milwaukee, when, on motion of Mr. Shinn, the Association finally adjourned, to meet again at Milwaukee, on the last Tuesday of August, 1884.

JOHN M. MAISCH, *Permanent Secretary.*

APPENDIX.

The following report was handed in at the third session, and should have been inserted on page 450:

REPORT OF COMMITTEE OF ARRANGEMENTS AND ENTERTAINMENTS FOR THE MEETING AT NIAGARA FALLS IN 1882.

Receipts.

Cash received from sale of tickets		$1512 00
Rent for Exhibition Hall		100 00
		$1612 00

Expenditures.

For use of Goat Island for Association	$223 00	
Railroad fare, Buffalo Singing Society	46 00	
Entertainment for Singing Society, hotel bill, etc.	92 00	
Carriages, Davy's bill	195 00	
Use of Prospect Park	223 00	
Services, F. C. Burdick	8 00	
Invoices—Rob. Sneider, A. P. A. Badges	48 00	
Orders of dancing	55 50	
Invitations and printed matter	53 00	
Badges for ladies and gents	15 00	
P. A. Porter, printing	2 50	
Expenses: T. J. Macmahan, telegraphing, postage, stationery, etc.	50 00	
E. P. Coby, printing	4 75	
Hotel expenses paid by G. J. Seabury for the Association	100 00	
Exhibition Hall	66 68	
Expenses of Local Secretary	33 32	
Sundry disbursements by W. H. Rogers	27 50	
For carriages for use of the Association	14 00	
For stationery and postage necessary for sending notices to members.	34 71	
George J. Seabury, railroad fares, hotel and legitimate expenses.	36 00	
		1327 96
Balance		$284 04
		$1612 00

The committee tender their thanks to Hiram E. Griffith, Local Secretary, and Julius Rieffenstahl for the efficient services rendered by them in carrying out the programme; also to several members who were ready and willing at all times to assist us in our labors, we extend our gratitude.

Very respectfully submitted,

GEO. J. SEABURY,
T. J. MACMAHAN, JR.,
Per H. W. ATWOOD,
WM. H. ROGERS.

President Thompson appointed the following committee to visit the National Wholesale Druggists' Association: Wm. A. Gellatly, New York;

Herman W. Atwood, New York; Daniel C. Robbins, New York; Andrew J. Ditman, New York, and W. J. M. Gordon, Cincinnati.

Council elected the following members: Melbourn A. Toulson, Chestertown, Md.; Jacob J. Fleck, Tiffin, Ohio; Robert S. Masters, Kentville, Nova Scotia.

The following delegates to the thirty-first annual meeting became members by signing the constitution and by-laws: J. Richardson Walton, Washington, D. C.: J. Howard Athey, Holly Springs, Miss.; Alexander K. Finlay, New Orleans, La.; John V. Fisher, Morristown, Ohio.

JOHN M. MAISCH, *Permanent Secretary.*

The rainy weather which prevailed during the week the meeting was held, interfered very materially with the entertainments proposed by the special committee, and the drive to the Soldier's Home and Park, and the visit to most of the departments had to be abandoned. In the afternoon of September 11, the ladies paid a visit to the Corcoran Art Gallery and examined the treasures of art collected there. On the same evening an instrumental and vocal concert was given to the members at Congregational Church. The following day, Wednesday, was spent mostly in the buildings of the Smithsonian Institution in the examination of the various collections and the drugs, chemicals, and utensils on exhibition. In the evening a ball was held at the new National Rifles' Hall. On Thursday, shortly after noon, when the weather began to assume a more favorable aspect, many members and most of the ladies visited the Executive Mansion and were introduced to the President of the United States, afterward the Treasury Department and several other Departments were visited. In the evening most of the members sat down to a banquet at Abner's Hall, while the ladies were entertained at the Arlington Hotel with music, songs, recitations, etc. On Friday, September, 14, after the final adjournment, the visitors embarked on the steamer "Mary Washington," which had been chartered by the Washington pharmacists for the occasion. After a pleasant sail down the Potomac, the party landed at Mount Vernon and visited the tomb of Washington, the old mansion with its many relics of last century and the extensive grounds. Substantial refreshments were provided on the lawn opposite the mansion, where several long rows of tables had been provided to accommodate the large number of visitors. Just twenty-five years previous, on September 16th, 1858, the Association on the occasion of its seventh annual meeting, visited Mount Vernon, and held a brief session on the front portico of the Mansion. Many of the the members then present are at rest from the earthly labors. Of those who are still living, we believe only three were present on this occasion from outside the limits of the District of Columbia. Towards evening the company reëmbarked on the steamer and proceeded to Washington, whence on the following day, most of the visitors departed for their homes.

LIST OF COLLEGES AND ASSOCIATIONS

HAVING ACCREDITED DELEGATES TO THE THIRTY-FIRST ANNUAL MEETING WITH THE ADDRESSES OF THEIR PRESIDENTS AND SECRETARIES.

COLLEGES OF PHARMACY.

	Presidents.	*Secretaries.*
California	F. C. Keil	Fred. Grazer.
Chicago	N. Gray Bartlett	Judson S. Jacobs.
Louisville	W. Rogers	Fred. G. Miller.
Maryland	Jos. Roberts	John W. Geiger.
Massachusetts		W. F. Sawyer,
New York	Ewen McIntyre	Geo. Inness.
Ontario	Neil C. Love	Geo. Hodgetts.
Philadelphia	Dillwyn Parrish	Wm. J. Jenks.
Pittsburgh	Geo. A. Kelly.	
St. Louis	H. E. Hoelke	W. C. Bolm.
Washington (National)	G. G. C. Simms	J. R. Walton.

STATE PHARMACEUTICAL ASSOCIATIONS.

	Presidents.	*Secretaries.*
Alabama	P. C. Candidus, Mobile	M. M. Stoner, Selma.
Arkansas		G. Cochran, Little Rock.
Connecticut	E. S. Sykes, Hartford	F. Wilcox, Waterbury.
Georgia	J. W. Rankin, Atlanta.	
Illinois		T. H. Patterson, Chicago.
Indiana	N. W. Yeakle, Lafayette	Jos. R. Perry, Indianapolis.
Iowa	J. H. Harrison, Davenport	E. L. Boerner, Iowa City.
Kansas	M. L. Stone, Wamego	R. H. T. Nesbitt, Leavenworth.
Kentucky	T. B. Wood, Lexington	A. J. Elwang, Louisville.
Louisiana	J. T. Thibodeaux, Thibodaux	B. Lewis, New Orleans.
Massachusetts	S. A. W. Sheppard, Boston	J. W. Colcord, Lynn.
Mississippi	J. W. Eckford, Aberdeen	H. S. West, Fayette.
New Hampshire	E. S. Russell, Nashua	G. F. Underhill, Concord.
New Jersey	R. W. Vandervoort, Newark	A. P. Brown, Camden.
New York		C. W. Holmes, Elmira.
North Carolina	W. H. Green, Wilmington	J. C. Munds, Wilmington.
Ohio	S. S. West, Cleveland	L. C. Hopp, Cleveland.
Pennsylvania	J. B. Duble, Williamsport	J. A. Miller, Harrisburg.
South Carolina	H. Baer, Charleston	P. Wineman, Charleston.
Texas	E. M. Wells, Forth Worth	W. H. Murdock, Dallas.
Virginia	C. A. Santos, Norfolk	E. R. Beckwith, Petersburg.
West Virginia	R. A. McCabe, Wheeling	C. Menkemeller, Wheeling.
Wisconsin	E. Sumner, Madison	E. B. Heimstreet, Janesville.

LOCAL PHARMACEUTICAL ASSOCIATIONS.

	Presidents.	*Secretaries.*
Albany County, New York	C. H. Smith, Albany	W. S. Elmendorf, Albany.
Cleveland, Ohio	S. S. West, Cleveland	A. Mayell, Cleveland.
Dauphin County, Pennsylvania	D. W. Gross, Harrisburg	J. A. Miller, Harrisburg.
Erie County, New York	R. K. Smither, Buffalo	H. P. Hayes, Buffalo.
Indianapolis, Indiana		F. H. Carter, Indianapolis.
Kings County, New York		C. R. Paddock, Brooklyn.
Lancaster County, Pennsylvania	R. S. Ross, Elizabetht'wn.	A. A. Hubley, Lancaster.
Lynn, Massachusetts		E. B. Gordon, Lynn.
Newark, New Jersey	D. W. Brant, Newark	W. M. Townley, Newark.
New York German Apothecaries.	A. Tsheppe, New York	C. E. Kessler, New York.
Orleans, Louisiana	W. Carson, New Orleans	L. C. Tebo, New Orleans.
Petersburg, Virginia	W. E. French, Petersburg.	R. W. Thompson, Petersb'g.
Richmond, Virginia	H. Blair, Richmond	J. Anthony, Richmond.
Washington, D. C.		G. A. Bentley, Washington.
Washington, D. C. (Drug Clerks).	E. Gladmon, Washington.	F. Luerssen, Washington.

ALUMNI ASSOCIATIONS OF COLLEGES OF PHARMACY.

	Presidents.	*Secretaries.*
Chicago	H. W. C. Martin, Chicago	C. G. Bittner, Mt. Carroll, Ill.
Massachusetts	E. W. Shedd, Boston	C. C. Williams, Boston.
Philadelphia	L. E. Sayre, Philadelphia	W. E. Krewson, Philada.
St. Louis	J. W. Tomfohrde, St. Louis	T. C. Loehr, St. Louis.
Washington (National)	A. M. Read, Washington	J. A. Watson, Washington.

LIST OF PUBLICATIONS RECEIVED

FOR THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Societies and editors are respectfully requested to forward all publications intended for the American Pharmaceutical Association to the Permanent Secretary. European exchanges, if not sent by mail, will reach us through the Smithsonian Institution at Washington.

JOHN M. MAISCH,
143 North Tenth Street, Philadelphia, Pa.

The Druggists' Circular, New York, 1883.
New Remedies, New York, 1883.
Oil, Paint, and Drug Reporter, New York, 1883.
Weekly Drug News, New York, 1883.
Deutsch-Amerikanische Apotheker-Zeitung, New York, 1883.
American Journal of Medical Sciences, Philadelphia, 1883.
American Journal of Pharmacy, Philadelphia, 1883.
The Pharmacist, Chicago, 1883.
The Druggist, Chicago, 1883.
Pacific Medical and Surgical Journal, San Francisco, 1883.
The Canadian Pharmaceutical Journal, Toronto, 1883.
Pharmaceutical Journal and Transactions, London, 1883.
Yearbook of Pharmacy and Transactions of the British Pharmaceutical Conference, 1883.
The Chemist and Druggist, London, 1883.
The Chemists' and Druggists' Diary, 1884.
Proceedings of the Philosophical Society of Glasgow, XIII., No. 2.
Transactions of the American Medical Association, 1882.
Archiv der Pharmacie, Halle, 1883.
Zeitschrift des Allgemeinen Oesterreichischen Apotheker-Vereines. Wien, 1883.
Anzeiger der K. K. Akademie der Wissenschaften. Wien, 1883.
Sitzungsberichte der K. B. Akademie der Wissenschaften, 1882, 2, 3.
Schweizerische Wochenschrift für Pharmacie, 1883.
Annual Report of the Mercantile Library Company of Philadelphia, 1882.
Annual Report of the Astor Library Company of the City of New York, 1882.
Calendar of the University of Michigan for 1883.
Annual Report of the President to the Corporation of Brown University, 1882.
Catalogue of the University of Vermont and State Agricultural College, 1882.
Proceedings of the New Jersey Pharmaceutical Association. 1883.

LIST OF SOCIETIES, LIBRARIES, JOURNALS AND INDIVIDUALS

TO WHOM COMPLIMENTARY COPIES OF THE PROCEEDINGS OF THIS ASSOCIATION ARE FORWARDED.

The State Libraries of all the States of the Union except Connecticut.

Maine Insane Asylum,	Augusta, Maine.
Bowdoin College,	Brunswick, “
Dartmouth College,	Hanover, New Hampshire.
New Hampshire Medical Society, Dr. G. P. Conn, Secretary,	Concord, “
Amherst College,	Amherst, Massachusetts.
Harvard University,	Cambridge, “
Massachusetts College of Pharmacy,	Boston, “
American Academy of Arts and Sciences,	“ “
Medical Library Association,	“ “
City Library,	“ “
City Hospital,	“ “
Massachusetts General Hospital,	“ “
Boston Athenæum,	“ “
University of Vermont,	Burlington, Vermont.
Brown University,	Providence, Rhode Island.
Trinity College,	Hartford, Connecticut.
Medical Journal and Library Association,	“ “
Connecticut Medical Society, C. W. Chamberlain, M. D.,	“ “
Silas Bronson Library,	Waterbury, “
Yale College,	New Haven, “
College of Pharmacy of the City of New York,	New York, New York.
Literary and Scientific Society of German Apothecaries,	“ “
Druggists' Circular,	“ “
American Druggist,	“ “
Oil, Paint, and Drug Reporter,	“ “
Weekly Drug News,	“ “
Deutsch-Americanische Apotheker Zeitung,	“ “
Pharmaceutische Rundschau,	“ “
Astor Library,	“ “
Mercantile Library,	“ “
Long Island Historical Society,	Brooklyn, “
New Jersey State Lunatic Asylum,	Trenton, New Jersey.
Philadelphia College of Pharmacy,	Philadelphia, Pennsylvania.
College of Physicians,	“ “

Franklin Institute,	Philadelphia, Pennsylvania.
Pennsylvania Hospital,	“ “
Academy of Natural Sciences,	“ “
American Philosophical Society,	“ “
Philadelphia Library,	“ “
Mercantile Library,	“ “
American Journal of Medical Sciences,	“ “
Pittsburgh College of Pharmacy,	Pittsburgh, “
Maryland College of Pharmacy,	Baltimore, Maryland.
University of Maryland,	“ “
Maryland Academy of Sciences,	“ “
Smithsonian Institution,	Washington, District Columbia.
Congressional Library,	“ “
Surgeon-General United States Army,	“ “
Surgeon-General United States Marine Hospital Service,	“ “
Surgeon-General United States Navy,*	“ “
Bureau of Education,	“ “
Department of Agriculture,	“ “
United States Patent Office,	“ “
National College of Pharmacy,	“ “
Library of the American Medical Association,	“ “
Richmond Pharmaceutical Association,	Richmond, Virginia.
Medical Society of Virginia, L. B. Edwards, M. D., Secretary,	“ “
South Carolina Medical Association, Dr. H. D. Fraser, Secretary,	Charleston, South Carolina.
Louisville College of Pharmacy,	Louisville, Kentucky.
Cincinnati College of Pharmacy,	Cincinnati, Ohio.
Cincinnati Academy of Medicine,	“ “
Mussey Medical Library,	“ “
Longview Asylum,	Carthage, Hamilton County, O.
University of Michigan,	Ann Arbor, Michigan.
Chicago College of Pharmacy,	Chicago, Illinois.
The Druggist,	“ “
Illinóis State Medical Society,	“ “
St. Louis College of Pharmacy,	St. Louis, Missouri.
St. Louis Academy of Science,	“ “
St. Louis Mercantile Library,	“ “
St. Louis Public School Library,	“ “
Kansas State University,	Lawrence, Kansas.
Minnesota State Medical Society, C. H. Boardman, M. D., Secretary,	St. Paul, Minnesota.
California College of Pharmacy,	San Francisco, California.
Pacific Medical and Surgical Journal,	“ “

Montreal College of Pharmacy, Montreal, Canada.
Ontario College of Pharmacy, Toronto, Canada.
Pharmaceutical Department, Halifax Medical College, Nova Scotia.
Escuela de Farmacia, Mexico.
Sociedad Medico-farmaceutico, Merida, Yucatan.
Sociedad de Farmacia Argentina, Buenos Ayres.

British Pharmaceutical Conference, London.
Pharmaceutical Society of Great Britain, London, 17 Bloomsbury Square.
Pharmaceutical Journal and Transactions, London.
Chemical News, London, Boy Court, Ludgate Hill, E. C.
Chemist and Druggist, London, 44 Cannon Street.
British Museum, London.
Philosophical Society, Glasgow.
Liverpool Chemists' Association.
Association of Chemists and Druggists, Wolverhampton.
Coventry and Warwickshire Pharmaceutical Association, Coventry.
Pharmaceutical Society at Edinburgh.
Pharmaceutical Society of Ireland, Dublin.
Nederlandsche Maatschappij ter bevordering der Pharmacie, Jacobus Polak, Secretary, Amsterdam.
Académie Royale de Médecine de Belgique, Bruxelles.
Société de Pharmacie Royale de Bruxelles.
Société Royale des Sciences Médicales et Naturelles, Bruxelles.
Société de Pharmacie d'Anvers.
Société de Pharmacie, Paris.
Répertoire de Pharmacie, Paris.
Schweizerische Wochenschrift für Pharmacie, A. Klunge, Aubonne.
Zeitschrift d. Allg. Oesterreichischen Apotheker-Vereins, Wien.
K. K. Gesellschaft der Aertze, Wien.
K. Akademie der Wissenschaften, Wien.
K. Bayer. Akademie der Wissenschaften, München.
Pharmaceutisches Institut, Universität Erlangen.
Universität Strassburg.
Journal de Pharmacie d'Alsace-Lorraine, N. Nicklès, Benfeld.
Archiv der Pharmacie, Waisenhausbuchhandlung, Halle.
K. Akademie der Wissenschaften, Göttingen.
Pharmaceutische Zeitung, Bunzlau.
Pharmaceutische Gesellschaft in St. Petersburg, St. Petersburg.
Pharmaceutisches Institut, Dorpat, Russia.
Pharmaceutical Institution, Stockholm, Sweden.
Kongelige Norske Universitet i Christiani.
Archiv for Pharmacie, S. M. Trier, Kjobenhavn.
Denmark's Apotheker Forening, Gust. Lodze, President, Odense.
R. Biblioteca Nazionale, Firenze, Italy.
Archivio di Farmazia, Roma, Italy.
Pharmaceutical Society of Victoria, Melbourne, Australia.
Pharmaceutical Society of New South Wales, Sydney.
Pharmaceutical Society of New Zealand, Auckland.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulteration.

2. To encourage proper relations between Druggists, Pharmaceutists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a Permanent Secretary, a Local Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom, with the exception of the Permanent Secretary, shall be elected annually, and shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting; when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

CHAPTER I.

Of the President and Vice Presidents.

ARTICLE I. The President shall preside at all meetings of the Association; in his absence or inability, one of the Vice-Presidents, or in the absence of all, a President *pro tempore* shall perform the duties of President.

ARTICLE II. He and the Vice-Precidents shall be *ex-officio* members of the Council.

ARTICLE III. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore.*

ARTICLE IV. In meetings the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports, and communications, and order the vote upon all proper questions at the proper time.

ARTICLE V. In all ballotings, and on questions upon which the yeas and nays are taken, the President is required to vote, but his name should be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal, and in case of such equal division, the motion is lost.

ARTICLE VI. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality or impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in cases where he prefers to submit the matter to the meeting; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VII. He shall have the right to call a member to the chair, in order that he may take the floor, in debate. He shall see that the Constitution and By-laws are properly enforced.

ARTICLE VIII. He shall appoint all committees, unless provided for in the By-laws, or otherwise directed by the Association.

ARTICLE IX. He shall sign the certificates of membership, and countersign all orders on the Treasurer. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE X. He shall present at each Annual Meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the Permanent Secretary.

Article I. The Permanent Secretary shall be elected to hold office permanently during the pleasure of the Association. He shall receive from the Treasurer an annual salary of $600, and the amount of his expenses incident to the meeting in addition to his salary.

Article II. He shall preserve fair and correct minutes of the proceedings of the meetings, and carefully preserve, on file, all reports, essays, and papers of every description received by the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Proceedings of the Association, under the direction of the Council.

Article III. He shall read all papers handed him by the President for that purpose; shall call and record the yeas and nays whenever they are required to be called; shall notify the chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act; and shall notify every member of the time and place of each Annual Meeting.

Article IV. He shall be, *ex-officio*, a member of the Council.

CHAPTER III.

Of the Local Secretary.

Article I. The Local Secretary shall be elected annually, near the close of the Annual Meeting, and shall reside at or near the place where the next Annual Meeting of the Association is to be held.

Article II. He shall assist the Permanent Secretary in his duties; shall co-operate with the Council and any local committee in making arrangements for the Annual Meeting; shall correspond with the chairman of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

CHAPTER IV.

Of the Treasurer.

Article I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

Article II. He shall pay no money except on the order of the Secretary, countersigned by the President, and accompanied by the proper vouchers.

Article III. He shall report to the Council, previous to each Annual Meeting, the names of such members as have failed to pay their annual contributions for three years, and also the names of such as have failed to return their certificates of membership after having been officially disconnected with the Association, and having been duly notified to return them.

Article IV. He shall present a statement of his accounts at each Annual Meeting of the Council, that they may be audited; he shall receive an annual salary of $500, and the amount of his expenses incident to the meeting, in addition to his salary.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services such sum as may be annually determined upon by the Council.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the Permanent Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the Permanent Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry, and Materia Medica, and the collateral branches of knowledge; on the changes in conditions of Pharmaceutical Institutions; together with such statistical, biographical, aud obituary notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceeding year, and end with June 30th of the year in which it is submitted; shall be written in a form fitted for the printer, and shall be presented completed at the Annual Meeting.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the Permanent Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which shall be empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association.

ARTICLE II. The Council shall consist of seventeen members, nine of whom shall be elected by ballot by the Association, in the following manner: Three of them to serve for one year, three for two years, three for three years. At each subsequent Annual Meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years.

ARTICLE III. The President, Vice-Presidents, Secretary, Local Secretary, Treasurer, and Reporter on the Progress of Pharmacy of the Association, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association, from one Annual Meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the Annual Meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council,—a Committee on Membership, a Committee on Publication, and a Committee on Finance,—to whom shall be referred such duties as are appropriate to their respective functions as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at one session of the Association the names of those candidates for membership which have been approved by the Committee on Membership, and the applicants shall be balloted for at the next session of the Council by the members present, when a vote of two-thirds shall be sufficient to elect them.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be balloted for without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members, and the names of any who, having become disconnected with the Association, refuse to return their certificates of membership as provided by the by-laws.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears one copy of the annual publication of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sittings of the Association, a complete synopsis of the minutes of the Council, the reports of the President and committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as they may deem worthy of insertion, and shall fix the price at which the Proceedings shall be sold.

CHAPTER VII.

Of Committees.

ARTICLE I. There shall be elected annually four standing committees: A Committee on the Drug Market, to consist of five members; a Committee on Papers and Queries, a Committee on Prize Essays, and a Committee on Legislation; each to consist of three members.

ARTICLE II. The Committee on the Drug Market shall report annually the condition of the Drug Market, the fluctuations in the supply and demand of drugs and chemicals, the variations in quality, and the adulterations and sophistications coming under their observation or reported to them by others, with any suggestions or recommendations for the improvement or better regulation of the trade; and they shall be authorized to report upon any adulterations and sophistications of immediate interest, through the Pharmaceutical Journals, as soon as practicable after their discovery.

ARTICLE III. The Committee on Papers and Queries shall report, near the close of each Annual Meeting, a proper number of questions of scientific and practical interest, the answers to which may advance the interest of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person writing a paper for the Association must, to insure its publication in the proceedings, refer the same with a synopsis of its contents to the Committee on Papers and Queries previous to the third session.

ARTICLE V. It shall be the duty of every Standing Committee making a report annually to the Association, in like manner to furnish a copy of the same, together with a synopsis of its contents, to the Committee on Papers and Queries, before the first annual session of the Association.

ARTICLE VI. The Committee on Prize Essays shall, within six months after the Annual Meeting at which the essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all other respects they shall be governed by the stipulations expressed by the donor. The decision of the committee, with such comments upon the successful essay only as they may deem proper, may be published in the Journals of Pharmacy.

ARTICLE VII. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report to each stated meeting of the Association what legislation on the subject has occurred during the year.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry, and Botany, who may be specially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of its Constitution and By-Laws, are willing to subscribe to them, are eligible to membership.

ARTICLE II. Any person eligible to membership may make application in writing, with the indorsement of any two members of the Association in good standing, to any member of the Council, who shall report his application to the said Council.

ARTICLE III. No person shall be a member of this Association, nor shall his name be placed upon the roll, until he shall have signed the Constitution and paid into the Treasury the sum of *Five Dollars* as an initiation fee, and the annual contribution for the current year, which sums must accompany the application.

ARTICLE IV. Every member shall pay in advance to the Treasury the sum of *Five Dollars* as his yearly contribution, and is liable to lose his membership by neglecting to pay said contribution for *three successive years.*

ARTICLE V. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE VI. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the Annual Meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year and the usual initiation fee: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name may have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials should be sent to the Permanent Secretary *at least two weeks* in advance of the Annual Meeting.

ARTICLE VII. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice President, Permanent Secretary, and Treasurer, at the same time covenanting to return the same to the proper officer on relinquishing their connection with the Association.

ARTICLE VIII. Persons constitutionally elected to membership become permanent members, and their membership can cease only by resignation, non-payment of dues, or by expulsion, as provided in these By-Laws.

ARTICLE IX. Resignation of membership shall be made in writing to the Permanent Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE X. Any member may be expelled for improper conduct or the violation of the Constitution, By-laws, or Ethics adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at some regular session.

ARTICLE XI. Pharmaceutists, chemists, and other scientific men, who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be equired to contribute to the funds, nor shall they be eligible to hold office, or vote at the meetings.

CHAPTER IX.

Of Meetings.

ARTICLE I. The meetings shall be held annually; Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. The order of business at the first session of each Annual Meeting shall be as follows:

Section 1. Promptly, at the time named in the notice issued for the meeting, the President, or in his absence one of the Vice-Presidents, or in their absence a President *pro tempore*, shall officiate.

Section 2. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the Permanent Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates. The Secretary shall then call the roll, noting the names of the delegates and members in attendance.

Section 5. The Council shall read the names of the candidates for membership, as provided in Section 2, Article VIII., Chapter VI.

Section 6. Reports of committees shall be presented, read by their titles, the synopsis, or in full, and laid on the table for future consideration.

Section 7. The President shall call the roll of Colleges and Associations represented, requesting each delegation in turn to appoint one member, the person so selected to act as a committee to nominate officers for the Association, the Standing Committees, and members of the Council for the ensuing year; in addition to which he shall appoint five members who are not delegates, to act with the committee.

Section 8. The minutes of the Council shall be read in full at the Annual Meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, their acts shall be revised, so as to be acceptable to the Association.

Section 9. A committee of five shall be appointed to examine and report upon specimens exhibited.

Section 10. Incidental business may be called up.

ARTICLE III. The order of business at the second session of each Annual Meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding meeting, which may be amended if necessary, and shall then be approved.

Section 3. The report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the Officers and Committees nominated shall be balloted for.

Section 4. The officers elected shall take their respective places.

Section 5. The Council shall present names recommended for membership.

Section 6. Reports of Standing Committees shall be read.

Section 7. Reports of Special Committees shall be read.

Section 8. The second session shall close with the examination of specimens on exhibition.

ARTICLE IV. The order of business at subsequent sessions shall be determined by the Council, with the consent of the Association.

ARTICLE V. *Section* 1. The Association invites manufacturers and others to exhibit at the Annual Meeting crude drugs, chemicals, pharmaceutical preparations, chemical and pharmaceutical apparatus and utensils, and such objects as possess a general scientific or special pharmaceutical interest.

Section 2. The following articles shall not be admitted to these exhibitions: Proprietary and patented medicines, medicinal or pharmaceutical preparations, the names of which have been copyrighted or the complete working formula for which is withheld, and such chemical preparations or mixtures which are offered under other than their proper scientifically recognized names.

Section 3. The Committee on Exhibition, appointed under Chapter VIII., Article II., Section 9, shall report during the meeting on the articles exhibited, with such comments as in their judgment may be deemed proper.

CHAPTER X.

Of Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the meeting, and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order in which they are arranged. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER IX.

Miscellaneous.

ARTICLE I. In all such points of order as are not noticed in these By-laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-laws shall be submitted in writing, and may be balloted for at any subsequent session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-laws.

ARTICLE III. No one or more of these By-laws shall be suspended.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices immediately after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence, or on account of inability from any cause, the Vice-Chairman; or, in the absence of both, a Chairman *pro tempore* shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council.

ARTICLE II. He shall post in a conspicuous place in the meeting-rooms the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose, shall call and record the yeas and nays whenever they are required to be called; he shall notify the chairman of every special committee of his appointment, giving him a list of his colleagues and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting.

CHAPTER IV.

Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of five members of the Council, to be elected annually by ballot. The Permanent Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect their chairman immediately after their election by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present the list of applicants for membership, who have complied with the requirements of the By-Laws of the Association, to the Council.

ARTICLE III. They shall furnish appropriate obituary notices of deceased members for publication in the Proceedings.

CHAPTER V.

On Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, who shall elect their chairman immediately after their own election by the Council.

ARTICLE II The Committee on Publication shall have charge of the publication and distribution of the Proceedings, and may select annually the portrait of a deceased member to be issued with the Proceedings.

CHAPTER VI.

On Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members. They shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the Permanent Secretary. They shall annually, at the meetings, and after due notice through the Pharmaceutical Journals, receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. After considering these applications, the Committee shall, at as early a date as possible, report to the Council, recommending such grants from the available funds as they may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

On Meetings.

ARTICLE I. The Council shall meet on the day immediately preceding that fixed for the assembling of the Association, and at such other times as they may adjourn to, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special meeting shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the standing committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its committees, and which can be disposed of by a positive or a negative vote, the Chairman of the Council, or the chairman of the committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present.

ARTICLE III. Every proposition to alter or amend these By-laws shall be submitted in writing, and may be balloted for at the next session of the Council, when, upon receiving the votes of three-fourths of the members present, it shall become a part of these By-laws.

FORM OF APPLICATION FOR MEMBERSHIP.

Approving of the objects of the American Pharmaceutical Association, I am desirous of joining it in membership; and having read its Constitution and By-laws, I hereby signify my approval of the same, and subscribe to them.

Address,

I hereby agree to return my certificate of membership in the American Pharmaceutical Association to the Treasurer of that body, if I shall hereafter cease to be connected in membership with it.

TESTIMONIALS.

The undersigned, members in good standing, being personally acquainted with of testify to his moral character, his skill as a practical druggist and pharmaceutist, and his professional probity and good standing, and they recommend him for membership in the American Pharmaceutical Association.

Names.	Address.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

AUSTRIA.

Anton von Waldheim, *Vienna*, 1871.

BELGIUM.

A. T. DeMeyer, *Brussels*, 1868.
Norbert Gille, *Brussels*, 1868.

ENGLAND.

Dr. John Attfield, *London*, 1871.
Dr. Robert Bentley, *London*, 1872.
Henry B. Brady, *Newcastle-on-Tyne*, 1871.
Dr. J. Redwood, *London*, 1871.
Michael Carteighe, *London*, 1882.
Thomas Greenish, *London*, 1882.
Joseph Ince, *London*, 1882.
Richard Reynolds, *Leeds*, 1882.
George W. Sanford, *London*, 1882.
Geo. F. Schacht, *Clifton*, *Bristol*, 1882.
Peter Squire, *London*, 1882.

FRANCE.

Dr. Augustin A. Délondre, *Sèvres*, 1871.
Stanilas Martin, *Paris*, 1872.
Dr. G. Planchon, *Paris*, 1877.
Dr. J. Léon Soubeiran, *Montpellier*, 1871.

GERMANY.

Dr. Christian Brunnengraeber, *Rostock*, 1882.
Dr. Adolph Duflos, *Annaberg*, 1871.
Dr. F. A. Flückiger, *Strassburg*, 1868.
Dr. Hermann Hager, *Pulvermühle bei Fürstenberg*, 1868.
Dr. Carl Schacht, *Berlin*, 1882.
Dr. G. C. Wittstein, *Munich*, 1868.

GREECE.

Dr. Xaver Landerer, *Athens*, 1877.

ITALY.

Cav. Niccola Sinimberghi, *Rome*, 1882.

NETHERLANDS.

Dr. J. E. De Vrij, *Hague*, 1871.

RUSSIA.

Dr. G. Dragendorff, *Dorpat*, 1868.
J. Von Martenson, *St. Petersburg*, 1882.

SWITZERLAND.

Dr. Edward Schaer, *Zurich*, 1877.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the Secretary and Treasurer of all changes of address.

(The names of life members in SMALL CAPITALS. Names of life-members under the old Constitution in *italics.*)

UNITED STATES OF AMERICA.

ALABAMA.

Mobile.

Candidus, Philip Charles. 1857
Hawkins, Joseph Thomas 1878
Mohr, Charles 1871
Moore, Thomas F. 1878
Punch, William Francis 1874
Savage, Thomas Jameson. 1881
Van Antwerp, Garet. 1880

Selma.

Galt, Edward Pegram . . . .

ARKANSAS.

Hot Springs.

Cabell, George William 1880
Eisele, Martin A 1881
Menard, Robert Patterson. 1883
Newman, Alcuin Eason 1880
Pollard, Frank Wilder. 1880

Little Rock.

Bond, John Barnitz 1883

Searcy.

Zimmerman, John L. 1883

CALIFORNIA.

San Francisco.

Brackett, Aurick Smith 1868
Calvert, John. 1870
Dawson, John H 1882
Joy, Edwin Wolcott. 1882
Lengfeld, Abraham Louis. 1879
Mack, Adolph 1880
Moffit, Thomas S 1861
Runyan, Edward Wheelock 1875
Searby, William Martin 1882
Simpson, William. 1870
Steele, Henry. 1859
Steele, James Gurden 1859
Wenzell, William Theodore 1870

Alameda, Alameda Co.

Elbe, Constantine Berthold. 1877

Eureka, Humboldt Bay.

Powell, Robert Baldwin 1880

Los Angeles.

Preuss, Edward Anthony. 1882

Santa Clara.

Oberdeener, Moses 1880

Vallejo, Solano Co.

Frost, James 1870
Topley, James. 1869

COLORADO.

Central City.

Best, John 1866

Denver.

Hartung, Hugo Rudolph. 1876
Scholtz, Edmund Louis 1881
Seward, Richard 1880
Steinhauer, Frederick 1881
Walbrach, Arthur. 1881

COLUMBIA, DISTRICT OF.

Washington.

Becker, Charles. 1875
Boyd, George Washington 1883
Bury, Edward Berkley. 1870
Christiani, Charles 1874
Coumbe, Oscar Henry 1883
Cromwell, Zachariah William. . . . 1870
Drew, John Waters 1876
Duckett, Walter G. 1876
Dufour, Clarence Reuter. 1876
Fickling, Charles Hollingshead . . . 1883

Knabe, Gustavus Alexander	1876
Lewis, Samuel Edwin	1875
Lockhart, George Bradfield	1883
Major, John Richards	1873
Martin, John Charles	1883
Milburn, John Alexander	1858
Milburn, Washington Coad	1883
Murray, Talbot Chambers	1883
Nattans, Arthur	1883
Pettingill, Edward True	1880
Reinlein, Paul	1856
Scala, William Franklin	1876
Schafhirt, Adolph Julian	1876
Short, Joshua Eagan	1883
Simms, Giles Green Craycroft	1860
Thompson, William Scott	1871
Tyson, Samuel Ellicott	1857
Walton, Joseph Richardson	1883
Wehrly, Thomas McAleer	1883

CONNECTICUT.

Ansonia.

Bristol, Charles Edward	1880

Hartford.

Chapin, Frederick Hastings	1880
Goodrich, Stephen	1875
Goodwin, Lester Henry	1875
Rapelye, Charles Andrew	1876
Williams, John Kirby	1875

Killingsworth.

Nichols, Edward Payson	1870

Litchfield.

Gates, Howard Eugene	1873

Meriden.

Parker, John Herbert	1880

Middletown.

Pitt, John Richard, Jr	1872

Naugatuck.

May, James Oscar	1875

New Britain.

Thomson, Edward Willett	1880

New Haven.

Benedict, Willis	1882
Francis, Walter R.	1882
Gessner, Emil Adolph	1878
Spalding, Warren Alphonso	1876
Sperry, Herman Jay	1880
Wells, Romanta	1877
Wood, Alonzo Felton	1876

Norwich.

Osgood, Hugh Henry	1875
Sevin, Nathan Douglas	1875

Stamford.

Haight, William Bogardus	1872

Waterbury.

Dikeman, Nathan	1859
Munson, Luzerne Ithiel	1872
Wilcox, Frederick	1878
Woodruff, Roderick Samuel	1876

West Winsted.

Phelps, Dwight	1873

Westville.

Melvin, J. Lacy	1882

Williamantic.

Wilson, Frank Milton	1883

Winsted.

Renouff, James Theron	1877

DAKOTA.

Bismarck.

Frisby, Frank	1880

Mitchell.

Warne, Henry Lee	1881

DELAWARE.

Wilmington.

Belt, Zedekiah James	1876
Smith, Linton	1870

FLORIDA.

Cedar Key.

Wooldridge, Napoleon	1883

Fort George.

Rollins, John Francis	1859

Jacksonville.

Hughes, Benjamin Longmore	1878

Opopka, Orange Co.

Kent, Robert Restieux	1855

Waldo.

Wheeler, Lucien Fitch	1858

GEORGIA.

Albany.

Welch, Leonard Edward	1878

Atlanta.

Behre, Charles Henry Ernst	1882
Bradfield, Louis Henry	1878
Jacobs, Joseph	1882
Rankin, Jesse Willis	1877
Schumann, Peter John	1878
Schumann, Theodore	1860

Augusta.

Land, Robert Henry	1859

Cuthbert.

Stanford, James William	1878

Macon.

Brunner, Norman Isaac	1878
Hunt, Leonard Washington	1878
Ingalls, John	1876
McConville, Thomas Aloysius	1864

Rome.

Fenner, William Roane	1871

ILLINOIS.

Bradford, Stark Co.

Plummer, David Graham	1869
Plummer, William Pitt	1881

Camp Point.

Bartells, George Case	1881

Chicago.

Ade, Samuel Gottlob	1883
Bartlett, Nicholas Gray	1864
BIROTH, HENRY	1865
Blahnik, Lorenz	1881
Blocki, William Frederick	1863
Borland, Matthew Wilson	1876
Buck, George	1860
Button, Charles Edwin	1881
Clapp, Chambers Brown	1883
Cowdrey, Robert Hall	1879
Dale, William Macmillan	1880
Ebert, Albert Ethelbert	1864
Fischer, Edward J.	1875
Fox, Daniel S.	1872
Fuller, Henry Weld	1865
Fuller, Oliver Franklin	1869
Gale, Edwin Oscar	1857
Gale, William Henry	1857
Garrison, Herod Daily	1869
Hallberg, Carl Swante Nicanor	1879
Hamilton, Emil	1881
Hartwig, Charles F.	1881
Henes, William Frederick	1876
Heuermann, Henry William	1869
Hogan, Lewis Cass	1876
Hogey, Julius Henry	1880
Jacobus, Judson Schradlow	1870
Kadlec, Lawrence Wesley	1880
Lord, Thomas	1882
Martin, Hugo W. C.	1881
Maynard, Henry Sherman	1880
McPherson, George	1865
Moore, James Penn	1872
Parsons, John	1865
Plautz, C. Herman	1881
Reinhold, William	1866
Sargeant, Ezekiel Herbert	1864
Somers, Frank Giddings	1877
Vogeler, Adolph Gustav	1876
Wheeler, Charles Gilbert	1876
WHITFIELD, THOMAS	1865
Wilson, Julius Henry	1869
Woltersdorf, Louis	1865
Zahn, Emil Augustus	1881

Danville.

Winslow, Edwin Cook	1879

Galesburg.

Clark, Albert Burr, Jr.	1868

Highland.

Knoebel, Edmund	1882
Mueller, Adolphus	1871

Peoria.

Allaire, Charles Bowen	1880
Stuart, Ennere Boyce	1880
Zimmermann, Charles	1881

Peru, La Salle Co.

Hattenhauer, Robert Christopher	1881

Quincy.

Schroder, Hermann	1871

Roseville.

Brewer, Percival	1881

INDIANA.

Alexandria.

Heagy, Weems Augustus	1880

Anderson.

Brandon, Joseph Francis 1879
Buck, Albert Byron 1879
Searle, Gideon Daniel 1880

Aurora.

Marshall, Hubert Joseph 1877
Riddell, James A. 1879

Cambridge City.

McCaffrey, James 1883

Evansville.

Schmidt, Florian Charles 1882
Schlaepfer, Henry John 1879

Fairmount.

Edwards, Nathan Wilson 1879

Indianapolis.

Borst, George Frederick 1881
Dill, John B. 1878
Driggs, Nathaniel S. 1881
Earnshaw, William Jonathan 1881
Frauer, Herman E. 1881
Haag, Julius A. 1879
Hurty, John N. 1882
Kielhorn, Henry 1874
Lambert, John Albert 1879
Lilly, Eli 1878
Lynn, Winfield Scott 1882
Martin, Emil 1878
Metzner, Adolph 1879
Miller, Charles Edward 1880
Mueller, Louis Henry 1879
Schrader, Henry 1869
Sloan, George White 1857
Staley, Michael C. 1881

Jasper, Dubois Co.

Mehringer, Joseph A. 1882

Jeffersonville.

Loomis, John Clarence 1876

Lafayette.

Hilt, David 1879
Reule, John 1882
Yeakel, Nathan Webb 1879

Lawrenceburgh.

Ferris, Charles Edward 1874

Kendallville.

Lohman, George H 1872

Madison.

Harper, Frank Merritt 1874

New Albany.

Knoefel, August 1879

Rensselaer.

Kanal, Emmet 1882

Seymour.

Andrews, Josiah Harding 1879

South Bend.

Eliel, Leo 1882

Tell City.

Schreiber, August 1876

Terre Haute.

Baur, Jacob 1879
Buntin, William Campbell 1874

Vincennes.

Watjen, Herman J. 1882

IOWA.

Boone.

Townsend, Abraham R. 1880

Burlington.

Wigert, Carl Reinhold 1876

Cedar Falls, Black Hawk Co.

Bryant, William Cullen 1881

Cedar Rapids, Linn Co.

Truax, Charles 1882

Clinton.

Major, Oscar 1880

Davenport.

Ballard, John Winthrop 1871
Harrison, Jacob Hugh 1883

Decorah.

Weiser, Emilius Ilgenfritz 1880

Des Moines.

Weaver, Charles Augustus 1880

Dubuque.

Ferdinand, George Adam 1879
Ruete, Theodore William 1870

Dyersville.

Bigelow, Israel, Jr. 1880

Fort Dodge.

Crawford, Robert Wilson 1881
Oleson, Olaf Martin 1877

Fort Madison.

Schafer, George Henry 1871

Indianola.

Buffington, Cyrus Adams. 1880

Iowa City.

Boerner, Emil Louis 1877

Marshalltown.

Birchard, Abner Theodore 1881

Monticello.

Tiarks, Hermann 1876

Newton.

Hogin, George B. 1881

Ottumwa, Wapello Co.

Ennis, William W. 1881
Prall, Delbert Elwyn 1879

Sioux City.

Moore, Silas Harwood 1880
More, Arthur James 1881

Waterloo.

Wangler, Conrad David 1876

KANSAS.

Abilene.

DeHuy, Bernard Henry 1883

Atchison.

Chapman, Garrett A. 1880

Belle Plaine.

Butler, George Frank 1883

Coffeyville.

Slosson, George. 1882

Florence.

Standford, William A. 1881

Girard.

Walker, George. 1881

Lawrence.

Leis, George 1869

Leavenworth.

Brown, Robert J. 1862

Nickerson, Reno Co.

Sturtevant, T. Frank 1880

Peabody.

Robert, Daniel John 1881

Sabetha.

Behne, Frank J. 1881

Salina.

Seitz, Oscar 1881

Stirling, Rice Co.

Plummer, Edwin Morton. 1881

KENTUCKY.

Bowling Green.

Burge, James Oscar 1878

Carrollton.

Geier, Oscar William 1880

Covington.

Zwick, George Gilbert 1874

Eminence.

Porter, Chelton Scott 1882

Flemingsburg.

Reynolds, John J. 1876

Frankfort.

Averill, William Henry 1874

Lewisport.

Martin, Charles C. 1881

Louisville.

Beckmann, Oscar Albert 1879
Colgan, John 1867
Davis, Vincent 1874
Diehl, Conrad Lewis 1863
Fischer, Phil. 1883
Huddard, John Fletcher 1870
Jones, Simon Newton 1870
Kessler, Edward Fredrik 1879
Miller, Frederick Christopher 1874
Newman, George Abner 1866
Pfingst, Edward Charles 1874
Pfingst, Ferdinand John 1867
Pfingst, Henry Adolph. 1874
Rademaker, Hermann Henry 1879
Renz, Frederick J. 1883
Rogers, Wiley 1874
Scheffer, Emil 1872

Schiemann, Edward Bernard	1880
Schoettlin, Albert John	1882
Springer, William Theodore	1882
Strassel, William	1870
Sutton, Peter Priest	1871
Wilder, Graham	1868

Newport.

Feth, Joseph George	1880

Nicholasville.

Oxley, Jefferson	1878

Shelbyville.

McKenney, Jesse Fisher	1878

Uniontown.

Hardigg, William Leopold	1881

LOUISIANA.

New Orleans.

Finlay, Alexander Kirkwood	1883
Keppler, Christian Lewis	1882
Lavigne, Jean Baptiste	1883
Lewis, Ben	1883
Lyons, Isaac Luria	1875
Mellon, John J.	1883

Baton Rouge.

Brooks, Francis Marion	1879

Bayou Goula.

Viallon, Paul Louis	1870

Franklin.

Frere, Alexander G.	1882

Houma.

Gonaux, François	1883

New Iberia.

Lee, James Augustin	1856

Plaquemine.

Dellavallade, Jean Michel	1873

Shreveport.

Morris, Thomas Henry	1881

Thibodeaux.

Roth, Eugene Norbert	1880
Thibodeaux, Joseph Theogine	1870

MAINE.

Augusta.

Partridge, Charles Kimball	1667

Bangor.

Harlow, Noah Sparhawk	1859
Sweet, Abel Sylvester, jr.	1883
Sweet, Caldwell	1881

Bath.

Anderson, Samuel	1876

Bidaeford.

Boynton, Herschell	1875

Blue Hill.

Morrill, Benjamin	1876

Eastport.

Shead, Edward Edes	1866

Ellsworth.

Parcher, George Asa	1875

Pittsfield.

Libby, Henry Fitzgerald	1882

Portland.

Cummings, Henry Thornton	1853
Dana, Edmund, Jr.	1877
Frye, George Carlton	1879
Hay, Henry Homer	1867
Jordan, William Henry	1871
Perkins, Benjamin Abbott	1878
Phillips, Walter Fiske	1859

Winterport.

Morrell, Mary Helen	1883

MARYLAND.

Baltimore.

Baxley, Jackson Brown	1856
Brack, Charles	1876
Burrough, Horace	1883
Caspari, Charles, Jr.	1883
Culbreth, David Marvel Reynolds	1883
Dohme, Charles Emile	1863
Dohme, Lewis	1859
Eareckson, Edwin	1875
Edwards, William Fletcher	1883
Elliott, Henry Alexander	1859
Emerson, Isaac Edward	1883
Emich, Columbus Valentine	1863
Frames, James Parker	1868
Gosman, Adam John	1870
Hancock, John Francis	1863
Hassencamp, Ferdinand	1872
Jefferson, John Henry Bailey	1868

Jennings, Nathaniel Hynson	1857
Lauer, Michael John.	1865
Lautenbach, Robert	1870
Monsarrat, Oscar	1856
Moore, Jacob Farris.	1856
Muth, John Philip.	1864
Perkins, Elisha Henry.	1857
Risk, Clarence H	1882
Roberts, Joseph.	1856
Russell, Eugene Janus.	1856
Russell, Edward Walton	1856
Sappington, Richard.	1870
Sharp, Alpheus Phineas	1855
Thompson, William Silver	1856
Thompson, William Partlow	1874
Thomsen, John Jacob	1856
Thomsen, John Jacob, Jr.	1883
Thornton, William Edward.	1883
Tilyard, Charles Slade	1867
Webb, John Alansen	1870
Winkleman, John Henry.	1864
Woodward, Samuel Morris	1874

Chestertown.

Stam, Colin Augustus	1882
Toulson, Melbourn Asbury.	1883

Cumberland.

Campbell, William Pendleton.	1879
Herman, John George.	1878
Shriver, Henry	1876
Shryer, Thomas Wilson.	1875

Frederick City.

Schley, Steiner	1878

Hagerstown.

Winter, Jonas.	1863

MASSACHUSETTS.

Boston.

Babo, Leopold	1859
Bartlet, William Williams.	1875
Bassett, Charles Harrison.	1867
Bolles, William Palmer.	1875
Boyden, Edward Cleveland.	1874
Browne, Clarence Edward	1880
Burley, Edward Porter.	1877
Burnett, Joseph.	1852
Campbell, Isaac Towle.	1859
Canning, Henry.	1865
Carter, Solomon.	1865
Chapin, William Amos.	1880
Colcord, Samuel Marshall	1852
Colton, James Byers.	1865
Covell, Thomas Jefferson.	1864
Cramer, Max.	1881
CUTLER, EDWARD WALDO.	1859
Davenport, Bennett Franklin	1879
Doliber, Thomas	1859
Drury, Linas Dana	1871
Follansbee, Sherman.	1875
French, George Washington.	1765
Godding, John Granville.	1875
Goodale, Thomas Trefethen	1879
Hoyt, George Melvin	1875
Jenkins, Luther Lincoln	1867
Jenks, Thomas Leighton	1875
Jones, James Taber	1875
Kelly, Edward Samuel.	1871
Leary, Jeremiah Thomas.	1869
Lincoln, Henry Ware	1853
Lowd, John Colby.	1871
Luce, Edgar Henry	1879
Markoe, George Fred. Holmes	1863
Melvin, James Samuel.	1853
Metcalf, Theodore.	1857
O'Brien, James John.	1875
Patch, Edgar Leonard.	1872
Patten, Ichabod Bartlett	1858
Pierce, William Herbert	1879
Prescott, Horace Augustus	1875
Restieaux, Thomas	1853
Sewall, David Jewett.	1875
Sharples, Stephen Paschell	1875
Shedd, Edwin Walter	1879
SHEPPARD, SAMUEL AIRUS DARLINGTON.	1865
Siegemund, Charles Augustus.	1882
Smalley, Elijah	1860
Snow, Jesse Walker.	1875
Stowell, Daniel	1875
Tompkins, Orlando	1859
Tower, Levi, Jr.	1860
Turner, Thomas Larkin.	1853
Underwood, Charles Gordsford	1865
Webster, Stephen	1875
Wilson, Benjamin Osgood.	1859
Winslow, Samuel Wallis	1875
Woodbridge, George Washington.	1859

Andover.

Parker, George Hawkins.	1874

Cambridge.

Hubbard, John Henry.	1866
Wood, Edward Stickney	1879

Cambridgeport.

Bayley, Augustus Ramsey	1859
Orne, Joel Stone	1859
Orne, Charles Parker	1874

Charlestown.

Marshall, Ernest Clifton	1875
Stacey, Benjamin Franklin	1860

Chelsea.

Buck, John	1855
Buck, John Lynain	1883

East Pepperell.

Dunham, Charles Sumner	1875

Fitchburg.

Choate, John	1877

Great Barrington.

Eddie, Charles Hurlbert	1882
Lillie, Charles Herbert	1875
Whiting, Frederick Theodore	1863

Haverhill.

Emerson, Charles B	1883
Frothingham, Edward Gilman	1875
Underhill, William Harvey	1879

Hingham.

Hunt, James Lewis	1865

Holyoke.

Ball, Charles Ely	1880
Morgan, Richard Evan	1875

Lawrence.

Whitney, Henry Martin	1859

Lee.

Pease, Francis Merrick	1880

Lowell.

Bailey, Frederick	1869
Butler, Freeman Hall	1874
Hood, Charles Ira	1871
Kidder, Samuel, Jr	1859

Lynn.

Colcord, Joseph Webster	1882

Marlborough.

Hartshorn, Frederick Arthur	1880

Maynard.

Wells, Charles William	1879

Middleboro.

Drake, Charles William	1873

Monson.

Phipps, John Mellen	1875

Natick.

Daniels, Samuel Olney	1875

New Bedford.

Blake, James Edwin	1866
Hadley, Frank Rufus	1872
Lawton, Charles Henry	1873
Lawton, Horace Allen	1873
Shurtleff, Israel Hammond	1875
Taylor, John Pitman	1875

Newton.

Hudson, Arthur	1882

Newton Centre.

Noble, John Joseph	1875

North Andover.

Berrian, George Washington	1857

Peabody.

Grosvenor, David P., Jr	1881

Pittsfield.

Atwood, Luther Lee	1876

Quincy.

Whall, Joseph Stokes	1873

Rockland.

Easton, Luther Waite	1875
Estes, Joseph Josslyn	1870

Rockport.

Blatchford, Eben	1857

Salem.

Luscomb, William E.	1881
Nichols, Thomas Boyden	1876
Price, Charles H	1882

Saugus.

Hill, James Ward Harris	1880

Shelbourne Falls.

Baker, Edwin	1875

Somerville.

Cowdin, George Henry	1875
Flanagan, Lewis Cass	1875

Springfield.

Alden, Charles Packard 1874
Webber, Joseph Terrence 1873

Stockbridge.

Clark, William Bills 1880

Taunton.

Drown, Lowell Appleton 1883

Walpole.

Pilsbury, Frank Otis 1881

Waltham.

Johnson, Horace Irving 1880

Warren.

Harwood, Frank Lucian 1875

West Acton.

Hutchins, Isaiah 1880

West Stockbridge.

Moore, James S. 1882

Worcester.

Bush, William 1875
Dinsmore, George Frederick 1879
Scott, George Theodore 1883
Scott, Nelson Ryan 1859
Williams, Duane Burnett 1881

MICHIGAN.

Adrian.

Ross, Ellison Halsey 1880

Ann Arbor.

Brown, Henry J. 1882
Eberbach, Ottmar 1869
Garrigues, Samuel Smith 1855
Prescott, Albert Benjamin 1871
Wrampelmeier, Theodore J. 1882

Battle Creek.

Wardell, Robert C. 1860

Chelsea.

De Puy, Casper Edward 1879

Detroit.

Caldwell, James William 1875
Hawkins, Henry 1880
Johnston, William 1860
Mackimmie, George D. 1881
Ronnefeld, Theodore. 1866
Vernor, James 1866

East Saginaw.

Melchers, Henry 1869

Evart, Osceola Co.

Bigelow, Charles F. 1881

Ionia.

Gundrum, George 1882

Muskegon.

Jesson, Jacob 1872

Saginaw City.

Keeler, William Henry 1872

Schoolcraft.

James, George Riley 1869

Ypsilanti.

Morgan, James 1859

MINNESOTA.

Minneapolis.

Nienstaedt, Hermann 1879

Mankato.

Jones, John Roger 1881

Preston.

Weiser, Albert 1880

St. Paul.

Noyes, Daniel R. 1882
Simmon, Karl 1880
Stierle, Adolph 1882

MISSISSIPPI.

Aberdeen, Monroe Co.

Eckford, Joseph William 1883
Tindall, Graham McFarlane 1880

Bay St. Louis.

Deléry, Edgar 1878

Columbus.

Frazee, George Blair 1880

Fayette.

West, Howell Forman 1883

Fort Gibson.

Shreve, John Alexander 1880

Greenville.

Finlay, John Pelham 1883

Holly Springs.

Athey, John Howard	1883

Jackson.

Ash, Matthew Franklin	1856

Okolona.

Buchanan, Henry Clay	1880

MISSOURI.

St. Louis.

Addington, William Bacon	1878
Ahlbrandt, Henry Ernst	1877
Alexander, Maurice William	1871
Blank, Alois	1871
Boehm, Solomon	1871
Catlin, Ephron	1871
Chamberlain, Guilford Tracy.	1853
Crawford, William H.	1864
Curtman, Charles Otto	1871
Featherston'h, Edward Richard	1871
Good, James Michener	1871
Grandjean, Charles	1871
Grandjean, Eugene	1871
Hemm, Francis	1881
Jones, Charles Kendall	1867
Klie, George Henry Charles	1878
Leitch, Arthur	1860
Mallinckrodt, Edward	1869
Meyer, Christian Fred. Gottlieb	1860
O'Brien, John W.	1881
Oldberg, Oscar	1873
Pauley, Frank Charles	1879
Physick, Henry Sandford	1870
Plumer, William S.	1879
Reichenbach, Frederick Francis	1879
Richardson, James	1882
Richardson, Joseph Clifford	1871
Sander, Enno	1858
Scheffer, Henry William	1863
Sennewald, Ferdinand William	1865
Tomfohrde, John William	1878
Ude, George	1871
Uhlich, Ferdinand G.	1881
Vardick, August Henry	1874
Westmann, Frank Henry	1882
Williamson, Edward John	1876

Boonville.

Sombart, John E.	1881

Carrollton.

Pettit, Henry M.	1881

Carthage.

Caffee, Amos Henry	1881

Chillicothe.

Boyce, Samuel F.	1871

Columbia.

Hurt, James Francis	1879
Webb, McHenry	1879

Glenwood.

Gray, Gilbert D.	1881

Hannibal.

Walker, Charles	1881

Joplin, Jasper Co.

Garrett, Oscar Newton	1881

Kansas City.

Arnold, Henry Clay	1881
Ford, James M.	1881
Ford, William Thomas	1878
Fridenberg, Eugene L.	1881
Gallagher, John A.	1881
Lahme, Charles Adolph	1881
Love, Charles Edward	1881
Young, Judson J.	1881

Macon.

Field, Amos	1871

Marshall.

Franklin, Philip H.	1881

Mexico, Adrian Co.

Llewellyn, John Frederick	1867

Miami, Saline Co.

Edmonds, Augustus R.	1881

Mound City.

Browning, Woodville	1882

Odessa, Lafayette Co.

Beardslee, Othniel	1881

Rich Hill.

Youngs, William	1883

Weston.

Parr, John Conrad	1856

NEBRASKA.

Omaha.

Goodman, Charles Frederick	1871

Kennard, Frank W. 1883
Kuhn, Norman Archibald 1878

NEVADA.

Virginia City.

Perkins, William Alexander 1869

NEW HAMPSHIRE.

Concord.

Eastman, Charles Smith 1874
Underhill, George Francis 1874

Dover.

Pinkham, Alonzo Taylor. 1874
Rackley, Benjamin Franklin 1874
TUFTS, CHARLES AUGUSTUS 1856
Vickery, William Henry 1874

Exeter.

MERRILL, CHARLES AUGUSTUS . . . 1858

Manchester.

Hubbard, George Jones. 1881
Lull, George Edward 1881
Miville, Francis Charles 1877
Perry, Bayard Taylor 1876

Nashua.

Russell, Elias Smith. 1875
Whitman, Nelson Samuel. 1875

New Market.

Dearborn, George Luther 1853
Twombly, John Herbert 1880

Portsmouth.

Marvin, Thomas Ellison Oliver . . . 1875
Preston, Andrew Peabody 1881
Thacher, Joseph Haven 1859

Rochester.

Hanson, Dominicus. 1878
Sanderson, Stephen Francis 1880

Somersworth.

Carleton, Robert Marsh. 1880
Moore, George. 1859

Suncook.

Hildreth, Charles Francis 1874

NEW JERSEY.

Belvidere.

Smith, Arthur G 1881

Bloomfield.

Scherff, John Philip 1877

Bordentown.

Carslake, George Middleton 1880

Burlington.

Vandegrift, John A 1867

Camden.

Brown, Albert Potts 1870
Test, Alfred William 1870

East Orange.

Davis, George Randolph 1883
Rumsey, Samuel Louis 1876

Elizabeth.

Brant, Edmund Wade 1882
Drake, Jonathan Baker 1875
Kent, Henry Avery, Jr. 1880
Loveland, William F. 1882
Oliver, William Murray 1875

Elizabethport.

Frohwein, Richard 1867

Englewood.

Rockefeller, Lucius 1880

Freehold.

Walker, Ansell. 1880
Walker, John Putnam 1881

Hackensack.

Adams, Hazen Wooster 1879

Hoboken.

Eschmann, Fred. William R 1880
KLUSSMAN, HERMANN. 1876

Jersey City.

Abernethy, Maxwell. 1865
Dougherty, Samuel Edward 1875
Foulke, James 1881
Laird, William Rudolph 1867
Turner, Isaac Worthington. 1882
White, George Henderson 1868
Wienges, Conrad 1875

Matawan, Monmouth Co.

Slater, Frank H. 1882

Medford.

Thorn, Henry Prickett 1879

Morristown.

Carrell, Eugene Ayers	1875
Dalrymple, Charles Hoagland	1882

Mount Holly.

WHITE, AARON SMITH	1860

Newark.

Betzler, Jacob	1880
Bruguier. Francis	1876
Dreher, Ernest	1869
Holzhauer, Charles	1873
Post, William Henry	1880
Sayre, William Henry	1877
Smith Charles Bradley	1868
Smith, Israel Preston	1876
Stamford, William Harrison	1876
Townley, William Mattison	1875
Vandervoord, Ransford Wells	1870
Van Winkle, Abraham	1871

New Brunswick.

Rust, William	1870

Newton.

Ryerson, Henry Ogden	1882

Ocean Grove.

Vansant, Robert Hays	1879

Orange.

Musler, Abram	1883
Parsons, Robert Edwin	1877
Vreeland, Cyrus Elias	1880

Orange Valley, Essex Co.

Yatman, John Lewis	1880

Plainfield.

Reynolds, Howard Prescott	1875
Shaw, Robert Johnston	1875
Voorhees, William Henry	1868

Red Bank, Monmouth Co.

Lockwood, Samuel Alexander	1880

Roselle.

Tiernan, Frank Mortimer	1880

Salem.

Bassett, Joseph	1880

South Amboy.

JAQUES, GEORGE WASHINGTON	1869

Trenton.

De Cou, James Clarke	1880
Mangold, Gustavus Adolph	1875
Rickey, Randal	1870

NEW YORK.

New York City.

Atwood, Herman White	1873
Balluff, Paul	1860
Balser, Gustavus	1875
Bedford, Peter Wendover	1859
Bendiner, Samuel	1882
Billings, Henry Merry	1869
Bond, Joseph Romulus	1876
Buehler, Edward Handy	1874
Burdge, Jacob Uriah	1876
Campbell, Horace Willard	1875
Carle, John, Jr.	1860
Chandler, Charles Frederic	1867
Chase, Charles Dyer	1881
Collins, Louis Dell	1880
Currie, John Harper	1858
Davis, Benjamin	1869
Dick, Dundas	1879
Ditman, Andrew J.	1868
Eimer, Charles	1872
Fairchild, Benjamin Thomas	1875
Fisher, William	1862
Fougera, Edmund Charles	1867
Fraser, Edward Allen	1873
Frey, John	1865
Gardner, Charles H	1881
Gardner, Robert Winthrop	1867
Gilmore, John Wesley	1872
Gellatly, William Adams	1858
Gridley, Junius	1853
Griffith, William Henry	1874
Hancock, John Henry	1870
Haviland, Henry	1857
Hays, David	1867
Hegeman, Johnson Niven	1880
Higgins, James Starkey	1862
Hobart, Charles Henry	1880
Hoffmann, Frederick	1867
Hohenthal, Charles Frederick Lebrecht	1865
Hudnut, Alexander	1857
Ihlefeld, Conrad H	1881
Imgard, Julius	1882
Inness, George	1878
Johnson, Edward Lawless	1860
Jungmann, Julius	1879

Kalish, Julius	1875
Kimmel, Henry	1867
Knapp, Frank Fiero	1880
Krehbiel, Gustavus	1865
Laber, Julius	1881
Lazell. Lewis T.	1858
Lehn, Louis	1874
Linn, William Blair	1880
Lins, Albert H	1881
Maclagan, Henry	1883
Macmahan, Thomas Jackson	1871
Main, Thomas Francis	1872
McIntyre, Byron Floyd	1876
McIntyre, Ewen	1873
McKesson, John, Jr	1867
Milhau, Edward Leon	1858
Molwitz, Ernest	1867
Morrison, Thomas Ormsby	1876
Neergaard, Sidney Herbert	1880
Newton, John	1880
O'Neil, Henry Maurice	1879
Osann, Bernhard	1882
Osmun, Charles Alvin	1868
Otto, Charles Henry	1880
Parsons, Henry B	1882
Peixotto, Moses Levi Maduro	1869
Pfingsten, Gustavus	1873
Powell, William Reuben	1880
Reichard, Frederick Alfred	1871
Reiss, Edward Charles	1882
Rice, Charles	1870
Ricksecker, Theodore	1875
Robbins, Charles Albert	1876
Robbins, Daniel C.	1862
Royce, Lucien Merriam	1866
Sands, George Gedney	1867
Scofield, James Stephen	1867
Seabury, George John	1876
Shearer, Edward Young	1880
Shedden, John William	1859
Sheils, George Emanuel	1860
Skelly, James Joseph	1866
Starr, Thomas	1870
Tidball, Walton Caldwell	1881
Tscheppe, Adolph	1876
Tuska, David	1881
Van der Emde, Reinhold	1879
Wanier, George Simon	1876
Weinman, Oscar Christian	1873
White, Philip Augustus	1872
Wichelus, Frederick	1881
Wickham, William Hull	1870
Wilson, William	1876
Wohlfarth, Justin	1879
Zellhoefer, George	1876

Brooklyn.

Aspinall, Walter Albert	1880
Baker, George M	1880
Bassett, Francis Morgan	1860
Benjamin, James Henry	1878
Brooks, George Washington	1879
Close, George Cassidy	1858
Curtiss, Charles Grenville	1866
Cutts, Foxwell Curtis, Jr.	1875
Davis, William Mortimer	1879
Day, Carlos Erastus	1870
Daycock, William Henry	1874
De Forest, William Pendleton	1879
Dennin, Charles	1875
Douglas, Henry, Jr	1875
Dudley, Oscar Earle	1877
Dunn, John Augustus	1867
Hale, Frederick	1855
Heydenreich, Emile	1867
Jones, Thomas	1868
Kitchen. Charles William	1865
Krieger, Philip	1876
Levy, Adolph	1877
Livingston, Barent Van Buren	1872
McElhenie, Thomas Diamond	1872
Menninger, Henry Joseph	1866
Newman, George Anthony	1865
Nicot, Louis Emile	1875
Niebrugge, John August	1861
Ollif, James Henry	1867
Owens, Richard John	1860
Parrish, Clemmons	1868
Pyle, Cyrus	1859
Raas. Francis	1877
Ramsperger, Gustavus	1860
Reusch, Ernst	1882
Reynolds, Charles E.	1882
Rich, Willis S.	1882
Sayre, Edward Augustus	1877
Snyder, Ambrose Chancellor	1867
Squibb, Edward Hamilton	1882
Squibb, Edward R.	1858
Stevens, Luther Fuller	1879
Strachan, William Edward	1880
Tartis, Alfred Joseph	1867
Ubert, Julius	1876
Underhill, Joseph Garness	1879
Vincent, William	1870

Wackerbarth, John. 1883
Wendler, Robert Frederick Wm. . . 1876
Wynn, William 1867

Albany.

Clement, Henry Bratt 1880
French, William Barker 1880
Gaus, Charles Henry. 1879
Gaus, Louis Henry 1880
Gibson, Charles H. 1880
Huested, Alfred Birch. 1879
McClure, Archibald. 1880
McClure, William Henry. 1880
Michaelis, Gustavus 1782
Sauter, Louis. 1879
Turner, George Heather 1880
Walker, William 1880
Wheeler, Leonard Hiram. 1883

Angola, Erie Co.

Oatman, Le Roy Sutherland 1872
Penfold, Henry J 1882

Athens.

Post, Elisha. 1876

Auburn.

Stanley, Edgar Clark. 1880

Ausable Forks.

Smith, Jay Hungerford. 1883

Bath, Steuben Co.

Knight, George Ely 1880
Dupuy, Eugene. 1852

Bergen.

Fisher, Amos Sawyer 1880

Buffalo.

Darlington, James Augustus. . . . 1882
Drefs, Charles A 1882
Harries, Oscar L 1882
Hayes, Horace Phillips. 1880
Peabody, William Huntington. . . . 1857
Rano, Charles Orlando. 1866
Rieffenstahl, Julius. 1879
Stoddart, Thomas. 1881
Tibbs, William Henry 1871

Castile, Wyoming Co.

Rolph, Charles W. 1882

Cambridge.

Williams, Richard Julius Coudray . . 1880

Catskill.

Dubois, William Laneman 1880
Dykeman, George Albert. 1880
Mott, George Frederick. 1880

Cornwall, Orange Co.

Hazen, Peter Perry 1882

Croton Landing.

Henry, Charles (Dworniczak). . . 1881

Elmira.

Holmes, Clayton Wood. 1876

Fishkill on Hudson.

Moith, Augustus Theodore 1860

Flushing.

Hepburn, John 1873
James, William T. 1882

Geneseo, Livingston Co.

Rogers, Arthur Henry. 1882

Gloversville, Fulton Co.

Miller, Jason Albert. 1879
Van Auken, Jerrie A. 1880

Greenbush.

Munger, John F. 1881

Hannibal.

Brewster, Wadsworth J. 1880

Holly, Orleans Co.

Bishop, Francis M. 1882

Hume, Alleghany Co.

Hopper, George S. 1881

Jamaica, L. I.

Baylis, Lewis Fosdick 1880
Goodale, Harvey Galusha 1879
Peck, George Lyman. 1883

Johnstown.

Cahill, John Francis 1880

Kinderhook.

Van Alstyne, Franklin B. 1882

Little Falls, Herkimer Co.

Hurley, John 1882

Lockport.

Rommel, Emanuel 1882
Sweet, Frederick K. 1880

Luzerne, Warren Co.

Miller, George Yerrington 1872

Malone.

Miller, Robert McCleferty 1880

Middletown.

KING, JAMES THEODORE 1859
Rogers, William Henry 1859

Mount Vernon.

Gill, George 1872

Newburgh.

Chapman, Isaac C. 1882
Gorham, John Ransom, Jr. 1879

Niagara Falls.

Griffith, Hiram Elijah 1875

Nyack, Rockland Co.

DeGraff, David 1879

Olean.

Coon, James Van Deventer 1880

Pike, Wyoming Co.

Sweet, William S. 1882

Port Chester.

Hyler, William Henry 1875

Port Jervis.

Cook, George Edward 1872

Potsdam.

Thatcher, Harvey Dexter 1865

Poughkeepsie.

Sherwood, Hezekiah Strong 1870

Richfield Springs.

Smith, Willard Alfred 1880

Rochester.

Aman, Henry 1882
Davis, Edward Hatch 1880
Haass, G. Herman 1872
Paine, James Dixon 1857
Schmitt, Joseph M. 1882
Smith, Willard 1880

Rome.

Bissell, John Gordon 1875
Broughton, Albert James 1876
Owens, James Alanson 1882

Rondout.

Laycock, Washington 1857

Sag Harbor.

Lobstein, Jacob Fred. Daniel 1868
Tooker, William Wallace 1879

Saratoga Springs.

Colcord, Jonathan Marshall 1880
Fish, Charles Frederick 1866
Mingay, James 1873
Pennington, Thomas Henry Sands . 1877

Schenectady.

Davis, Edward L. 1881
Duryee, George Elliott 1880
Hanson, Willis Tracy 1880

Silver Creek, Chautauqua Co.

Montgomery, Melvin 1882

Spencerport.

Milliner, William Seward 1877

Stapleton, S. I.

Feeny, James 1882

Stillwater, Saratoga Co.

Schermerhorn, Winfield Scott . . . 1880

Syracuse.

Dawson, Edward Seymour, Jr. . . . 1876
Snow, Charles Wesley 1876

Tompkinsville, L. I.

Bassett, John William 1875

Tonawanda, Erie Co.

Scoville, Charles Emery 1882

Utica.

Blaikie, William 1879

Wappinger's Falls.

Shrader, John L. 1880

Waterville, Oneida Co.

Bissell, Emery Gilbert 1879

Wellsville, Alleghany Co.

Hall, Edwin Bradford 1879

Yonkers.

Finkel, Charles Edwin 1880

NORTH CAROLINA.

Ashville.

Lee, James Hardy 1880

Chapel Hill.

Saunders, Richard Banbury 1858

Durham, Orange Co.

Vaughan, P. W. 1882

Fayetteville.

Hinsdale, Samuel Johnston 1875
Sedbury, Bond E. 1882

Goldsboro.

Hatch, Eugene Francis 1883

Greensboro.

Porter, W. C. 1880

Raleigh.

Simpson, William 1873

Tarboro.

Cordon, John Gray Myers 1882
Zoeller, Edward Victor 1878

Washington.

Gallagher, Charles Kewell 1857

Wilmington.

Harding, John Haywood 1881
McIlhenny, John K 1881
Munds, James Cassidy 1878

Winston.

Smith, Samuel Holmes 1879

OHIO.

Cincinnati.

Bain, Andrew Watson 1874
Beebe, John Walter 1880
Eger, George 1864
Elfers, Joseph C. 1881
Faust, Charles 1879
Feemster, Joseph Hall 1873
Fennell, Adolphus 1864
Goodman, Emanuel 1879
Gordon, William John Maclester . . 1854
Greve, Theodore Lund August . . . 1864
Greyer, Julius 1880
Heinemann, Otto 1864
Helman, Charles Martin 1864
Heun, Emil 1881
Hildreth, Newton Gough 1879
Hottendorf, Augustus 1864
JUDGE, JOHN FRENCH 1866
Karmann, William 1864
Koehnken, Herman Henry 1875
Kuerze, Robert Meinrad 1880
Lammert, C. Joseph 1881
Lloyd, John Uri 1870
Martin, William J. 1881
Meininger, Albert 1881
Merrell, George 1879
Phillips, Charles Wilson 1881
Rendigs, Charles Peter 1876
Reum, Herman Frank 1864
Ruppert, John 1880
Sauer, Louis W. 1882
Schreck, Leo S. 1881
Schuerman, Frederick 1881
Serodino, Herman 1880
Thorp, Abner 1879
Vilter, Herman 1881
Wagner, Henry 1876
Walton, Harry C. 1881
Wayne, Edward Simmous 1854
Wells, Jacob David 1864
Yorston, Matthew Mackay 1864

Akron.

Armstrong, Andrew Morehouse . . . 1876
Smith, Joseph Stahle 1878

Ashtabula.

Thurber, Almon Russell 1880

Belleville, Richland Co.

Warren, Mrs. Ella F. 1882

Bluffton, Allen Co.

Hauenstein, William 1883
Murray, Francis Marion 1876

Bryan.

Snyder, Alva Leach 1873

Canton.

Somers, George Horace 1881

Chillicothe.

Howson, Walter Henry 1875
Nipgen, John Alvin 1879

Circleville.

Evans, Samuel B. 1881

Cleveland.

Asplin, John Harding 1882
Benedict, James I. 1882
Bruce, James 1882
Cobb, Ralph Lathrop 1883
Dreher, Louis 1881
Gaylord, Henry Cleveland 1869
Gegelein, Frederick L. 1881

Glines, George W.	1881
Haber, Louis Anthony	1881
Hartness, William Henry	1872
Hechler, George Louis	1882
Hopp, Lewis Christopher	1876
Keiper, Louis	1881
Linden, Hugo F.	1882
May, Arthur	1881
Mayell, Alfred	1872
Myers, Daniel	1882
Parsons, Richard	1882
Rosenwasser, Nathan	1880
Schambs, George Mathias	1882
Schellentrager, E. A.	1882
Scott, William Johnson	1872
Slosson, Frank W.	1882
Smithnight, Albert	1882
Spencer, Peter Ignatius	1872
Spieth, William F.	1882
Urban, Jacob P.	1881
Vaupel, Charles P.	1872
Weichsel, Franz	1881

Columbus.

Herbst, Frederick William	1882
Hoffman, Otto L.	1883
Huston, Charles	1872
Karb, George James	1883
Kaufman, George B.	1882
Schueller, Ernst	1881
Schueller, Frederick William	1880
Sherwood, Louis Walker	1882

Dayton.

Weusthoff, Otto Sittell	1879

Delhi, Hamilton Co.

Carpenter, Samuel William	1883

Delphos.

Evans, Hugh W.	1881
Wahmhoff, Julius Henry	1880

Gallipolis.

Schaaf, Justus Henry	1875

Hamilton.

Schwartz, John C.	1871

Logan.

Harrington, Frank	1869

Massillon, Stark Co.

Baltzly, Zachariah Taylor	1876
Kirchhofer, Peter Paul	1881

Middletown.

Johnson, Charles Brayton	1876

Morristown.

Fisher, John Vance	1883

Napoleon.

Leist, Jacob L.	1881

Navarre.

Grossklaus, John Ferdinand	1859

New Lisbon, Columbiana Co.

Pettit, Louis Clark	1881

New Madison, Darke Co.

Hagemann, James F. S.	1882

North Baltimore, Wood Co.

Clark, Frank P.	1882

Saint Paris.

Chance, Samuel	1881

Salem, Columbiana Co.

Hawkins, Michael Smith	1870

Sandusky.

Graham,, William Augustus	1876

South Charleston.

Armstrong, George Revington	1877

Spring Valley.

Lyon, C. Wesley	1881

Springfield.

Casper, Thomas Jefferson	1867
Coblentz, Virgil	1882
Ludlow, Charles	1872
Siegenthaler, Harvey N.	1882
Troupe, Theodore	1881

Tiffin.

Fleck, Jacob J,	1883
Marquardt, Jacob F.	1881

Toledo.

Hohley, Charles.	1872
Reed, Isaac Newton	1881

Troy.

Tobey, Charles William	1879

Watertown.

Bohl, Conrad	1881

West Liberty.

Kurfurst, Henry F.	1881

Westerville.

Baumgartner, Frederick	1880

Wilmington.

Foland, Daniel J.	1881

Wooster.

Ohliger, Lewis Philip	1871

Zanesville.

Graham, Willis H.	1881
Hatton, Edgar Melville	1878

OREGON.

Portland.

Sitton, Charles Edward	1878

PENNSYLVANIA.

Philadelphia

Angney, John R.	1867
Bakes, William Courtney	1864
Bauer, Louis Gustavus	1867
Blair, Andrew	1865
Blair, Henry Cowen	1868
Borell, Henry Augustus	1874
Boring, Edwin McCurdy	1867
Bower, Henry	1860
Bower, Henry Albert	1868
Bowker, James	1876
Bullock, Charles	1857
Bunting, Samuel Sellers	1857
Campbell, Hugh	1876
Campbell, Samuel	1864
Cook, Thomas Penrose	1877
Dobbins, Edward Tompkins	1867
Eberle, Charles Louis	1865
Eddy, Henry Clay	1869
Ellis, Evan Tyson	1857
England, Robert	1868
Fox, Peter Paul	1869
Fruh, Carl Daniel Stephan	1876
Gaillard, Edward	1876
Genois, Louis	1876
Gerhard, Samuel	1873
Grahame, Israel Janney	1856
Grove, John Eberly	1868
Haenchen, Charles Eugene	1865
Hance, Edward H.	1857
Hancock, Charles W.	1868
Hassinger, Samuel Eliphat Reed	1880
Heintzelman, Joseph Augustus	1858
Hoskinson, J. Thomas, Jr.	1881
Hurst, John Corry	1868
Jenks, William J.	1858
Johnson, Benjamin Franklin	1859
Jones, Alexander Henry	1874
Jones, David Sexton	1859
Jones, Edward Charles	1864
Keasbey, Henry Griffith	1873
Keeney, Caleb Reynolds	1868
Keys, Roger	1868
Kline, Mahlon Norwood.	1876
Koch, Louis	1872
Krewson, William Egbert	1875
Maisch, John M	1856
Mattison, Richard Vornselons.	1873
McIntyre, William.	1868
McKelway, George Irvin.	1874
Mellor, Alfred	1864
Miller, Adolphus William.	1868
Milligan, Decatur.	1867
Moore, Joachim Bonaparte	1860
Moorhead, William Walker.	1876
Murray, Bernard James.	1882
Newbold, Thomas Mitchell.	1876
Ottinger, James Jeremiah.	1876
Painter, Emlen	1870
Parrish, Dillwyn.	1870
Patterson, James Lemon	1876
Perot, Thomas Morris	1857
Pile, Gustavus.	1881
Preston, David	1868
Procter, Wallace	1874
Remington, Joseph Price.	1867
Riley, Charles William.	1868
Rittenhouse, Henry Norman	1857
Robbins, Alonzo	1865
Roche, Edward Manning.	1868
Rosengarten, Mitchell George.	1869
Sayre, Lucius Elmer.	1883
Shivers, Charles.	1860
Shinn, James Thornton.	1860
Shoemaker, Richard Martin.	1869
Shryock, Allen	1868
Simpers, John Wilmer.	1874
Somers, Richard Miller.	1876
Spannagel, Charles Christian	1874
Taylor, Alfred Bower	1852
Thompson, William Beatty	1858
Thomson, William M	1883
Trimble, Henry.	1876
Troth, Samuel Fothergill.	1857
Walsh, Robert Henry	1879
Warner, William Richard	1857

Webb, William H.	1867
Weber, William.	1872
Weidemann, Charles Alexander	1868
Wendel, Henry Edward	1873
Wiegand, Thomas Snowdon.	1857
Wilder, Hans Matthias.	1866
Wolff, Lawrence.	1882
Worthington, Jeremiah Willits.	1873
Wright, Archibald Wesley	1868
Zeilin, John Henry.	1859

Alleghany City.

Armor, Alpheus.	1882
Eggers, Frederick Hermann.	1872
Robertson, Archibald C	1882

Allentown.

Klump, Charles C.	1880

Beaver, Beaver Co.

Andriessen, Hugo.	1875

Bellefonte, Centre Co.

Zeller, William S	1881

Bethlehem.

Meyers, Edward Tobias	1867

Bristol.

Pursell, Howard.	1880

Carlisle.

Horn, Wilbur Fisk.	1876

Chambersburg.

Cressler, Charles Henry	1868

Columbia.

Meyers, James Alfred	1867

Danville.

Sechler, James C	1878

Derry Station.

Thomas, George Massena.	1883

Easton.

Weaver, John Archibald	1873

Erie.

Nick, Frederick.	1883

Franklin.

Riesenman, Joseph	1883

Hanover, York Co.

Eckert, Edwin Gilbert.	1883
Snively, Andrew Jackson.	1883

Harrisburg.

George, Charles Theodore	1873
Gross, Edward Ziegler.	1883
Miller, Jacob Augustus.	1873

Hyde Park, Luzerne Co.

Morgan, Benjamin George	1876

Lancaster.

HEINITSH, CHARLES AUGUSTUS.	1857

Lebanon.

Karch, Joseph Jacob.	1876
Lemberger, Joseph Lyon.	1858
Redsecker, Jacob Henry	1881

Lewisburg, Union Co.

Schaffle, Samuel Wilson Wykoff.	1876

Lock Haven.

Prieson, Adolph.	1880

McKeesport.

Bochert, George.	1883

Mansfield, Tioga Co.

Ridgway, Lemuel A.	1882

Milton.

Alleman, Emanuel Allison	1880

Minersville.

Burns, John Kellar	1876

New Brighton.

Kennedy, Thomas.	1880

New Wilmington.

Smenner, J. Edwin.	1881

Norristown.

Poley, Francis Henry	1880
Stahler, William.	1880

Oil City.

Griffith, Albert Richard	1870
Griffith, Alphonso de Lamartine.	1879

Pittsburg.

Beach, Clifton Hilliard.	1883
Cherry, James Bonbright	1868
Emanuel, Louis.	1878
Holland, Samuel Smith.	1876
Hostetter, Charles Michael	1870
Kelly, George A.	1882
Kerr, James, Jr.	1876
Nisbet, William Washington	1883

Schneider, Mathias Martin	1883
Wilson, Albert Hemphill	1883

Pittston.

Rhoades, Stephen Howard	1876

Pottsville.

Deibert, Thomas Irvin	1882
Kennedy, George Washington	1869

Quakertown.

Penrose, Stephen Foulke	1871

Reading.

Fox, Daniel Soder	1872
Raser, John Bernard	1872
Smith, Stephen Douglas	1833
Stein, Jacob Henry	1869
Ziegler, Philip Milton	1867

Scottdale, Westmoreland Co.

Cummings, Theodore Foster	1882
McNeil, John Murray	1882

Shippensburg.

Fleming, Frank Byerly	1883

Smethport, McKean Co.

Armstrong, Alvin Backus	1882

Tamaqua.

Albrecht, Emil	1875

Titusville.

Thompson, Ebenezer Kirk	1882

Towanda.

Porter, Henry Carroll	1880

West Chester.

Evans, Joseph Spragg	1877

White Haven.

Driggs, Charles M.	1881

Wilkesbarre.

Hair, James	1881
Wolf, Nathaniel	1878

Williamsport.

Cornell, Edward Augustus	1873
Duble, Jesse Balderston	1870

York.

Patton, John Franklin	1880

RHODE ISLAND.

Newport.

BLACKMAN, LYMAN RAWSON	1865
Groff, John Edward	1879
Taylor, James Henry	1875

Niantic.

Vars, Enoch Wilcox	1880

Providence.

Alfreds, Henry James	1883
Blanding, William Bullock	1875
Calder, Albert Layton	1859
Cone, John Wright	1876
Danforth, Edmund Culver	1878
Greene, William Ray	1883
Leith, Harvey Isaac	1883
Mason, Norman Nelson	1875
Reynolds, William Keyes	1876
Wood, Mason B.	1882

Westerley.

Colin, Albert Burlingame	1882
Latimer, Robert Fulton	1857

SOUTH CAROLINA.

Aiken.

Harbers, William Henry	1875

Charleston.

Aimar, Charles Pons	1879
Burnham, Edward Steinmeyer	1874
Eckel, Augustus William	1874
Gibson, William Andrew	1874
Luhn, Gustavus Johann	1873
Marsteller, George Ludwig	1883
Michaelis, Charles Otto	1874
Moise, Benjamin Franklin	1876
Panknin, Charles Frederick	1874

Columbia.

Thomas, Oscar Ernest	1882

TENNESSEE.

Memphis.

Hessen, George Archibald	1880
Robinson, James Scott	1869
Safford, William Burr	1875

Nashville.

Laurent, Eugene Leonard	1872
Thomas, James, Jr.	1875
Wharton, John Criddle	1872
Wharton, William Henry	1876

TEXAS.

Austin.

Morley, William Jarman	1876

Bryan.

McLelland, Robert Clayton	1880

Corsicana.

Campbell, John Gordon	1879

El Paso.

Irvin, William Armstrong	1879

Fort Worth.

Harper, Harry W.	1881
Powell, Thomas Wallace	1874
Wells, Ebenezer Miller	1878

Waco.

King, Walter Blackburn	1883

VERMONT.

Brandon.

Crossman, George Alvin	1872

Burlington.

Van Patten, William James	1876

Chester.

Pierce, Frederick Webster	1879

Morrisville.

Gates, Amasa O.	1876

Rutland.

Higgins, Albert Warren	1870
Lewis, Elam Clark	1870

St. Johnsbury.

Bingham, Charles Calvin	1875
Randall, George Dallas	1875

White River Junction.

Trask, Charles Mitchell	1875

Windsor.

Paine, Milton Kendall	1875

VIRGINIA.

Danville.

Cole, H. W.	1882
Wiseman, Henry Adolphus	1883

Fredericksburg.

Hall, Marshall Carter	1870

Norfolk.

Jackson, Edward Calvert	1883
Masi, Frederick Henry	1873

Petersburg.

Knock, Thomas Franklin	1882

Richmond.

Baker, Thomas Roberts	1873
Blunt, Ira Washington	1873
Bodeker, Henry	1873
Purcell, John Barry	1875
Scott, William Henry	1873

WASHINGTON TERRITORY.

Seattle.

Kellogg, Gardner	1882

Walla Walla.

Holmes, Henry Elliott	1880

WEST VIRGINIA.

Charleston, Kanawha Co.

Boggs, Edwin Leslie	1872
Potterfield, Clarence A.	1882

Parkersburg.

Williams, Alfred Neveth	1883

Wheeling.

Bocking, Edmund	1874
Gray, William Howlett	1880
McCullough, Winfield Scott	1880
Menkemeller, Charles	1880
Nagle, Asher Christian	1881
Williams, William H.	1880
Young, Alexander Thomas	1876

WISCONSIN.

Beloit.

Fenton, Frank S.	1881

Evansville, Rock Co.

Griswold, De Witt Clinton	1881

Fond du Lac.

Huber, Jacob Charles	1880

Fort Atkinson.

Slocum, Frank Leroy	1880

Fountain City.

Bechmann, Charles Richard	1882

Geneva.

Miner, Morris Ashbel	1880

Geneva Lake.

Arnold, Robert Bruce	1879

Janesville.

Heimstreet, Edward Burton	1874
Prentice, Fred. F.	1876

Kenosha.

Robinson, Frederick	1881

La Crosse.

Beyschlag, Charles	1880

Madison.

Power, Frederick Belding	1872

Menasha.

Bates, Augustin E.	1881

Milwaukee.

Abbott, Frank	1880
Bantly, Bartholomew	1881
Coffin, Samuel Lockwood	1879
Conrath, Adam	1881
Dadd, John Alfred	1880
Drake, John Ransom	1860
Schrank, Henry Charles	1876
Senier, Frederick Sutherland	1874

Neillsville.

Sniteman, Charles C.	1881

Watertown.

Eberle, Herman Theodore	1875

DOMINION OF CANADA.

NEW BRUNSWICK

Kentville.

Masters, Robert Silas	1883

Moncton.

Estey, Edwin M.	1882

NOVA SCOTIA.

Halifax.

Simson, Francis Cook	1876

ONTARIO.

Goodrich.

Jordan, Frederick Francis	1877

Lindsay.

Gregory, Edmund	1875

London.

Saunders, William	1860

Simcoe.

Foster, William Orville	1881

Stratford.

Waugh, George James	1862

Toronto.

Henderson, John	1877
Hodgetts, George	1877
Johnson, Stuart William	1881
Lander, John Cambridge	1877
Lowden, John	1875
Pearce, James H.	1880
Robinson, William Sherlock	1877
Rose, Henry John	1872

Windsor.

Priddy, Robert Samuel	1882

QUEBEC.

Montreal.

Evans, Henry Sugden	1880
Gray, Henry Robert	1867

Quebec.

Giroux, Edmund	1878
McLeod, Roderick	1880

Three Rivers.

Williams, Richard Welllington	1883

BERMUDA.

Hamilton.

Heyl, James B.	1863

U. S. OF COLOMBIA.

Guatemala.

Herbruger, Florence Charles	1876

MEMBERS RESIDING IN EUROPE.

Burroughs, Silas Mainvielle, London, England.	1876
Morris, Lemuel Iorwerth, Strassburg, Germany.	1880
Wellcome, Henry Solomon, London, England.	1875

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

Attfield, Dr. John, Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.
Bentley, Dr. Robert, Professor of Materia Medica and Botany to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.
Brady, Henry B., F. R. S., Hillfield, Gateshead, England.
Brunnengraeber, Dr. Christian, Rostock, Germany.
Carteighe, Michael, F. I. C., 180 New Bond Street, London, W., England.
Délondre, Dr. Augustin A., 20 Rue des Juifs, Paris, France.
De Meyer, A. T., Bruxelles, Belgium.
De Vrij, Dr. J. E., 54 Heerengracht, the Hague, Netherlands.
Dragendorff, Dr. G., Professor of Pharmacy at the University of Dorpat, Russia.
Duflos, Dr. Adolph, Professor, Annaberg, Germany.
Flückiger, Dr. Frederick A., Professor in the University of Strassburg, Germany.
Gille, Norbert, Professor in the École Vétérinaire de l'Etat, Bruxelles, Belgium.
Greenish, Thomas, F. C. S., 20 New Street, Dorset Square, London, N. W., England.
Hager, Dr. Hermann, Pulvermühle bei Fürstenberg, Germany.
Ince, Joseph, F. L. S., 11 St. Stephen's Avenue, Shepherd's Bush, W., London, England.
Landerer, Dr. Xaver, Professor, Athens, Greece.
Martenson, Magister J. von, Kinderhospital des Prinzen von Oldenburg, St. Petersburg, Russia.
Martin, Stanislas, Paris, France.
Planchon, Dr. G., Professor, Paris, France.
Redwood, Dr. Theophilus, Professor of Pharmacy to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.
Reynolds, Richard, F. C. S., Cliff Lodge, Hyde Park, Leeds, England.
Sandford, George W., 47 Piccadilly, London, W., England.
Schacht, Dr. Carl, 56 Mittelstrasse, Berlin, N. W., Germany.
Schacht, George F., F. C. S., 52 Royal York Cresct., Ctifton, Bristol, England.
Schaer, Dr. Edward, Professor of Pharmacy, Zurich, Switzerland.
Sinimberghi, Cav. Niccola, Via Condotti, Roma, Italy.
Soubeiran, Dr. J. Léon, Professor of Pharmacy, École de Pharmacie, Montpellier, France.
Waldheim, Anton von, 17 Himmelpfortgasse, Wien, I., Austria.
Wittstein, Dr. G. C., 47 Königstrasse, München, Germany.

ACTIVE MEMBERS.

Abbott, Frank, Milwaukee, Wis.
Abernethy, Maxwell, No. 188 Newark avenue, Jersey City, N. J.
Adams, Hazen W., No. 73 Main street, Hackensack, N. J.
Addington, William B., No. 700 Olive street, St. Louis, Mo.
Ade, Samuel G., No. 126 Milwaukee Ave., Chicago, Ill.
Ahlbrandt, Henry E., S. E. cor. Fifteenth and Carr streets, St. Louis, Mo.
Aimar, Charles P., No. 469 King street, Charleston, S. C.
Albrecht, Emil, Tamaqua, Pa.
Alden, Charles P., No. 270 Main street, Springfield, Mass.
Alexander, Maurice W., cor. Fourth and Market streets, St. Louis, Mo.
Alfreds, Henry J., No. 311 Eddy street, Providence, R. I.
Allaire, Charles B., No. 108 Main str[illegible]t, Peoria, Ill.
Alleman, Emanuel A., care of Cyrus Brown, Milton, Pa.
Aman, Henry, No. 139 East Main street, Rochester, N. Y.
Anderson, Samuel, No. 48 Front street, Bath, Me.
Andrews, Josiah H., S. E. cor. Chestnut and Second streets, Seymour, Ind.
Andriessen, Hugo, P. O. Box 39, Beaver, Beaver county, Pa.
Angney, John R., cor. Fifth and Spruce streets, Philadelphia, Pa.
Armor, Alpheus, No. 57 Taylor avenue, Allegheny City, Pa.
Armstrong, Alvin B., Smethport, McKean county, Pa.
Armstrong, Andrew M., No. 106 East Market street, Akron, O.
Armstrong, George R., No. 2 Union Block, South Charleston, O.
Arnold, Henry C., Kansas City, Mo.
Arnold, R. Bruce, cor. Main and Broad streets, Geneva Lake, Wis.
Ash, Matthew F., P. O. Box 129, Jackson, Miss.
Aspinall, Walter A., Nos. 1147 and 1149 Fulton street, Brooklyn, N. Y.
Asplin, John H., No. 227 Prospect street, Cleveland, O.
Athey, J. Howard, Holly Springs, Miss.
Atwood, Herman W., No. 846 Broadway, New York, N. Y.
Atwood, Luther L., No. 7 North street, Pittsfield, Mass.
Averill, William H., No. 435 Main street, Frankfort, Ky.
Babo, Leopold, No. 12 Boylston street, Boston, Mass.
Bailey, Frederick, P. O. Box 314, Lowell, Mass.
Bain, Andrew W., City Hospital, Cincinnati, O.
Baker, Edwin, Bridge street, Shelbourne Falls, Mass.
Baker, George M., No. 487 Manhattan avenue, Brooklyn, N. Y.
Baker, T. Roberts, No. 919 East Main street, Richmond, Va.
Bakes, William C., No. 145 North Tenth street, Philadelphia, Pa.
Ball, Charles E., No. 221 High street, Holyoke, Mass.
Ballard, John W., No. 106 West Second street, Davenport, Iowa.
Balluff, Paul, No 632 Sixth avenue, New York.
Balser, Gustavus, No 137 Avenue B, New York.
Baltzly, Zacharias T., Opera Block, Massillon, O.
Bantly, Bartholomew, Milwaukee, Wis.
Bartells, George C., Camp Point, Ill.
Bartlett, Nicholas G., N. W. cor. Twenty-third street and Indiana avenue, Chicago, Ill.
Bartlet, William W., No. 675 Shawmut avenue, Boston, Mass.
Bassett, Charles H., No. 504 Washington street, Boston, Mass.
Bassett, Francis M., cor. Atlantic avenue and Court street, Brooklyn, N. Y.
Bassett, John W., Tomkinsville, L. I., N. Y.

Bassett, Joseph, No. 119 Market street, Salem, N. J.
Bates, Augustus E., Milwaukee, Wis.
Bauer, Louis G., corner Fifth and Fairmount avenue, Philadelphia, Pa.
Baumgartner, Frederick, Nos. 701–703 Main street, Westerville, O.
Baur, Jacob, Terre Haute, Ind.
Baxley, J. Brown, cor. Howard and Franklin streets, Baltimore, Md.
Bayley, Augustus R., No. 607 Main street, Cambridgeport, Mass.
Baylis, Lewis F., P. O. Box 34, Jamaica, Queen's county, L. I.
Beach, Clifton H., cor. Shiloh and Sycamore streets, Pittsburg, Pa.
Beardslee, Othniel, Odessa, Lafayette county, Mo.
Bechmann, Charles R., Fountain City, Wis.
Becker, Charles, No. 1367 Thirty-second street, West Washington, D. C.
Beckmann, Oscar A., No. 686 Broadway, cor. Baxter avenue, Louisville, Ky.
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Behne, Frank J., Sabetha, Kansas.
Behre, Charles H. E., Schumann's Pharmacy, Atlanta, Ga.
Belt, Z. James, No. 601 Market street, Wilmington, Del.
Bendiner, Samuel J., No. 47 Third avenue, New York, N. Y.
Benedict, James I., Pearl and Church streets, Cleveland, O.
Benedict, Willis, No. 303 Congress avenue, New Haven Conn.
Benjamin, James H., No. 493 Tompkins avenue, Brooklyn, N. Y.
Berrian, George W., North Andover, Mass.
Best, John, No. 1 German Block, Central City, Col.
Betzler, Jacob, No. 121 Union street, Newark, N. J.
Beyschlag, Charles, La Crosse, Wis.
Bigelow, Charles F., Evart, Osceola county, Mich.
Bigelow, Israel J., Main street, Dyersville, Iowa.
Billings, Henry M., No. 278 Greenwich street, New York, N. Y.
Bingham, Charles C., No. 5 Bank Block, Main street, St. Johnsbury, Vt.
Birchard, Abner T., Marshalltown, Iowa.
BIROTH, HENRY, No. 111 Archer avenue, Chicago, Ill.
Bishop, Francis M., Holley, Orleans county, N. Y.
Bissell, Emery G., Main street, Waterville, Oneida county, N. Y.
Bissell, John G., No. 45 Dominick street, Rome, N. Y.
BLACKMAN, LYMAN R., No. 167 Thames street, Newport, R. I.
Blahnik, Lorenz, No. 88 West Eighteenth street, Chicago, Ill.
Blaikie, William, No. 202 Genesee street, Utica, N. Y.
Blair, Andrew, cor. Eighth and Walnut streets, Philadelphia, Pa.
Blair, Henry C., cor. Eighth and Walnut streets, Philadelphia, Pa.
Blake, James E., No. 64 North Second street, New Bedford, Mass.
Blanding, William B., Nos. 54 and 58 Weybosset street, Providence, R. I.
Blank, Alois, No. 1353 South Fifth street, St. Louis, Mo.
Blatchford, Eben, No. 32 Main street, Rockport, Mass.
Blocki, William F., No. 85 South Clark street, Chicago, Ill.
Blunt, Ira W., Inner Court, between Eleventh and Twelfth and Main and Cary streets, Richmond, Va.
Bochert, George, No. 87 Fifth street, McKeesport, Pa.
Bocking, Edmund, No. 1 Odd Fellows' Hall, Wheeling, W. Va.
Bodeker, Henry, cor. Fifteenth and East Main streets, Richmond, Va.
Boehm, Solomon, No. 800 Morgan street, St. Louis, Mo.
Boerner, Emil L., Haas Block, Clinton street, Iowa City, Iowa.
Boggs, Edwin L., Kanawha Bank Building, Charleston, Kanawha county, W. Va.
Bohl, Conrad, Watertown, O.
Bolles, William P., No. 571 Dudley street, Boston, Mass.
Bond, John B., Little Rock, Ark.
Bond, Joseph R., New York, N. Y.

Borell, Henry A., No. 2043 Chestnut street, Philadelphia, Pa.

Boring, Edwin M., cor. Tenth and Fairmount avenue, Philadelphia, Pa.

Borland, Matthew W., No. 378 West Van Buren street, Chicago, Ill.

Borst, George F., No. 440 S. Meridian street, Indianapolis, Ind.

Bower, Henry, cor. Gray's Ferry road and Twenty-ninth street, Philadelphia, Pa.

Bower, Henry A., cor. Sixth and Green streets, Philadelphia, Pa.

Bowker, James, cor. Sixth and Vine streets, Philadelphia, Pa.

Boyce, Samuel F., west side of Public Square, Chillicothe, Mo.

Boyd, George W., C street, N. E., between Second and Third streets, Washington, D. C.

Boyden, Edward C., cor. of Joy and Myrtle streets, Boston, Mass.

Boynton, Herschell, No. 74 Main street, Biddeford, Maine.

Brack, Charles, cor. Ensor and Forrest streets, Baltimore, Md.

Brackett, Aurick S., No. 109 Powell street, San Francisco, Cal.

Bradfield, Louis H., cor. Decatur and Pryor streets, Atlanta, Ga.

Brandon, Joseph F., No. 18 E. Anderson street, Anderson, Ind.

Brant, Edmund W., 292 Broad street; Elizabeth, N. J.

Brewer, Percival, Roseville, Ill.

Brewster, Wadsworth J., Hannibal, N. Y.

Bristol, Charles E., No. 48 Main street, Ansonia, Conn.

Brooks, Francis M., Baton Rouge, La.

Brooks, George W., No. 1161 Myrtle avenue, Brooklyn, N. Y.

Broughton, Albert J., No. 64 Dominick street, Rome, N. Y.

Brown, Albert P., cor. Fifth and Federal streets, Camden, N. J.

Brown, Henry J., No. 2 Main street, Ann Arbor, Mich.

Brown, Robert J., Leavenworth, Kan.

Browne, Clarence E., No. 39 Harrison avenue, Boston, Mass.

Browning, Woodville, Mound City, Mo.

Bruce, James, No. 544 Prospect street, Cleveland, O.

Bruguier, Francis, No. 557 Market street, Newark, N. J.

Brunner, Norman I., cor. Fourth and Arch streets, Macon, Ga.

Bryant, William C., Cedar Falls, Black Hawk county, Ia.

Buchanan, Henry C., north side Main street, Okolona, Miss.

Buck, Albert B., Anderson, Ind.

Buck, George, S. W. cor. State and Madison streets, Chicago, Ill.

Buck, John, Nos. 104 and 106 Winnisimmet street, Chelsea, Mass.

Buck, John L., Winnisimmet street, Chelsea, Mass.

Buehler, Edward H., No. 170 William street, New York, N. Y.

Buffington, Cyrus A., Hotel Block, Indianola, Ia.

Bullard, George S., No. 98 Genesee street, Utica, N. Y.

Bullock, Charles, No. 528 Arch street, Philadelphia, Pa.

Buntin, William C., No. 600 Main street, Terre Haute, Ind.

Bunting, Samuel S., cor. Tenth and Spruce streets, Philadelphia, Pa.

Burdge, Jacob U., No. 482 Seventh avenue, New York, N. Y.

Burge, James O., Bowling Green, Ky.

Burley, Edwin P., No. 43 Temple Place, Boston, Mass.

Burnett, Joseph, No. 27 Central street, Boston, Mass.

Burnham, Edward S., Charleston. S. C.

Burns, J. Kellar, cor. Sunbury and Lecona streets, Minersville, Pa.

Burrough, Horace, Baltimore, Md.

Burroughs, Silas M., 8 Snow Hill, London, England.

Bury, Edward B., No. 412 Eighth street, S. E., Washington, D. C.

Bush, William, No. 56 Front street, Worcester, Mass.

Butler, Freeman H., No. 141 Central street, Lowell, Mass.

Butler, George F., Belle Plaine, Kan.

Button, Charles E., No. 1558 Wabash avenue, Chicago, Ill.

Cabell, George W., No. 211 Central avenue, Hot Springs, Ark.

Caffee, Amos H., Carthage, Mo.

Cahill, John F., No. 119 Main street, Johnstown, N. Y.
Calder, Albert L., No. 163 Westminster street, Providence, R. I.
Caldwell, James W., No. 242 Grand River avenue, Detroit, Mich.
Calvert, John, S. E. cor. Kearney and Clay streets, San Francisco, Cal.
Campbell, Horace W., No. 84 Front street, New York, N. Y.
Campbell, Hugh, cor. Twenty-first and Locust streets, Philadelphia, Pa.
Campbell, Isaac T., No. 239 West Broadway, Boston, Mass.
Campbell, John G., Corsicana, Texas.
Campbell, Samuel, No. 1412 Walnut street, Philadelphia, Pa.
Campbell, William P., No. 61 Baltimore street, Cumberland, Md.
Candidus, Philip C., cor. Dauphin and Cedar streets, Mobile, Ala.
Canning, Henry, No. 90 Green street, Boston, Mass.
Carle, John, Jr., No. 153 Water street, New York, N. Y.
Carleton, Robert M., Somersworth, N. H.
Carpenter, Samuel W., Delhi, Hamilton county, O.
Carrell, Eugene A., Washington street, Morristown, N. J.
Carslake, George M., S. W. cor. Farnsworth and Church streets, Bordentown, N. J.
Carter, Solomon, No. 355 Washington street, Boston, Mass.
Caspari, Charles, Jr., cor. Fremont and Baltimore streets, Baltimore, Md.
Casper, Thomas J., No. 41 East Main street, Springfield, O.
Catlin, Ephron, cor. Sixth street and Washington avenue, St. Louis, Mo.
Chamberlain, Guilford T., St. Louis, Mo.
Chance, Samuel, Saint Paris, O.
Chandler, Charles F., cor. Fourth avenue and Fiftieth street, New York, N. Y.
Chapin, William A., cor. Beach and Lincoln streets, Boston, Mass.
Chapman, Garrett A., Atchison, Kan.
Chapman, Isaac C., No. 111 Water street, Newburgh, N. Y.
Chase, Charles D., No. 7 Gold street, New York, N. Y.
Cherry, James B., No. 23 Fourth avenue, Pittsburgh, Pa.
Choate, John, No. 208 Main street, Fitchburg, Mass.
Christiani, Charles, No. 484 Pennsylvania avenue, Washington, D. C.
Clapp, Chambers B., No. 527 State street, Chicago, Ill.
Clark, Albert B., Jr., No. 9 Main street, Galesburg, Ill.
Clark, Frank P., North Baltimore, Wood county, O.
Clarke, William B., Stockbridge, Mass.
Clement, Henry B., No. 684 and 686 Broadway, Albany, N. Y.
Close, George C., cor. Smith and Schermerhorn streets, Brooklyn, N. Y.
Cobb, Ralph L., No. 112 Superior street, Cleveland, O.
Coblentz, Virgil, No. 167 West Main street, Springfield, O.
Coffin, Samuel L., No. 90 Wisconsin street, Milwaukee, Wis.
Colcord, Jonathan M., Saratoga, N. Y.
Colcord, Joseph W., 153 Union street, Lynn, Mass.
Colcord, Samuel M., Dover, Mass.
Cole, H. W., Danville, Va.
Colgan, John, cor. Tenth and Walnut streets, Louisville, Ky.
Collins, Albert B., No. 48 Main street, Westerly, R. I.
Collins, Louis D., No. 280 Greenwich street, New York, N. Y.
Colton, James B., No. 766 Tremont street, Boston, Mass.
Cone, John W., No. 48 North Main street, Providence, R. I.
Conrath, Adam, No. 1330 State street, Milwaukee, Wis.
Cook, George E., No. 111 Pike street, Port Jervis, N. Y.
Cook, Thomas P., No. 838 North Ninth street, Philadelphia, Pa.
Coon, James V. D., No. 81 Union street, Olean, N. Y.
Cordon, John G. M., Main str., Tarboro, N.C.
Cornell, Edward A., cor. Pine and Tenth streets, Williamsport, Pa.
Coumbe, Oscar H., cor. Tenth and E streets, N. W., Washington, D. C.
Covell, Thomas J., Rock Island, Ill.

Cowdin, George H., No. 25 Union Square, Somerville, Mass.

Cowdrey, Robert H., No. 527 State street, cor. Harmon court, Chicago, Ill.

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Crawford, Robert W., Fort Dodge, Ia.

Crawford, William H., No. 800 Washington avenue, St. Louis, Mo.

Cressler, Charles H., cor. Front and Main streets, Chambersburg, Pa.

Cromwell, Zachariah S., No. 480 Pennsylvania avenue, Washington, D. C.

Crossman, George A., No. 2 Simond's Block, Brandon, Vt.

Culbreth, David M. R., cor. Charles and Eager streets, Baltimore, Md.

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Cummings, Theodore F., Scottdale, Westmoreland county, Pa.

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Curtman, Charles O., No. 3718 North Ninth street, St. Louis, Mo.

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Dalrymple, Charles H., Washington street, Morristown, N. J.

Dana, Edmund, Jr., No. 373 Congress street, Portland, Me.

Danforth, Edmund C., No. 75 Randall street, Providence, R. I.

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Darlington, James, A., No. 326 Clinton street, Buffalo, N. Y.

Davenport, Bennett F., No. 751 Tremont street, Boston, Mass.

Davis, Benjamin, No. 466 Grand street, New York, N. Y.

Davis, Edward H., Rochester, N. Y.

Davis, Edward L., cor. Union and Bates streets, Schenectady, N. Y.

Davis, George R., Main str., E. Orange, N. J.

Davis, Vincent, cor. Sixth and Chestnut street, Louisville, Ky.

Davis, William M., No. 689 De Kalb avenue, Brooklyn, N. Y.

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Dawson, John H., Twenty-third and Valencia streets, San Francisco, Cal.

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Daycock, William H., No. 649 Bedford avenue, Brooklyn, N. Y.

De Cou, James C., No. 44 E. State street, Trenton, N. J.

De Forrest, William P., Fifth avenue cor. Dean street, Brooklyn, N. Y.

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De Puy, Casper E., cor. Main and Middle streets, Chelsea, Mich.

Dearborn, George L., No. 156 Main street, New Market, N. H.

Deibert, Thomas I., No. 103 North Centre street, Pottsville, Pa.

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Diehl, C. Lewis, cor. Third and Broadway, Louisville, Ky.

Dikeman, Nathan, cor. Leavenworth and Dikeman streets, Waterbury, Ct.

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Ditman, Andrew J., No. 10 Astor House, New York, N. Y.

Dobbins, Edward T., No. 1412 Walnut street, Philadelphia, Pa.

Dohme, Charles E., cor. Pratt and Howard streets, Baltimore, Md.

Dohme, Louis, cor. Pratt and Howard streets, Baltimore, Md.

Doliber, Thomas, No. 39 Tremont street, Boston, Mass.

Dougherty, Samuel E., No. 65 Brinkerhoff street, Jersey City, N. J.

Douglass, Henry, Jr., No. 68 Wythe avenue, Brooklyn, N. Y.

Drake, Charles W., No. 275 Main street, Middleboro, Mass.

Drake, Jonathan B., No. 132 Broad street, Elizabeth, N. J.

Drake, John R., No. 255 S. Water street, Milwaukee, Wis.

Drefs, Charles A., No. 166 Broadway, Buffalo, N. Y.

Dreher, Ernest, No. 953 Broad street, Newark, N. J.

Dreher, Louis, No. 302 Euclid avenue, Cleveland, O.

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Driggs, Nathaniel S., Indianapolis, Ind.

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Duble, Jesse B., cor. Pan and Fourth streets, Williamsport, Pa.

Du Bois, William L., No. 281 Main street, Catskill, N. Y.

Duckett, Walter G., cor. Twenty-second street and Pennsylvania avenue, Washington, D. C.

Dudley, Oscar E., No. 62 E. One Hundred and Twenty-fifth street, Brooklyn, N. Y.

Dufour, Clarence R., No. 1814 Fourteenth street, Washington, D. C.

Dunn, John A., No. 56 Dougherty street, Brooklyn, N. Y.

Dupuy, Eugene, Soldiers' and Sailors' Home, Bath, Steuben county, N. Y.

Duryee, George E., No. 191 State street, Schenectady, N. Y.

Dykeman, George A., Catskill, N. Y.

Eareckson, Edwin, cor. Baltimore and High streets, Baltimore, Md.

Earnshaw, William J., No. 38 Huron street, Indianapolis, Ind.

Eastman, Charles S., N. E. cor. Main and Depot streets, Concord, N. H.

Easton, Luther W., Union near Webster street, Rockland, Mass.

Eberbach, Ottmar, No. 12 South Main street, Ann Arbor, Mich.

Eberle, Charles L., No. 4779 Germantown avenue, Philadelphia, Pa.

Eberle, Herman T., care G. E. Eberle & Son, Watertown, Wis.

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Eckel, Augustus W., No. 231 King street, Charleston, S. C.

Eckert, Edwin G., Fred street, Hanover, Pa.

Eckford, Joseph Wm., Commerce street, Aberdeen, Miss.

Eddy, Henry C., cor. Eighteenth and Lombard streets, Philadelphia, Pa.

Eddy, Charles H , Main street, Great Barrington, Mass.

Edmonds, Augustus R., Miami, Saline county, Mo.

Edwards, Nathan W., Main street, Fairmount. Ind.

Edwards, William F., No. 334 East Baltimore street, Baltimore, Md.

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Eggers, Frederick H., No. 72 Ohio street, Allegheny City, Pa.

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Eisele, Martin A., Hot Springs, Ark.

Elbe, Constantine B., Webster street and Santa Clara avenue, Alameda, Cal.

Elfers, Joseph C., No. 42 Budd street, Cincinnati, O.

Eliel, Leo, South Bend, Ind.

Elliott, Henry A., No. 286 Lexington street, Baltimore, Md.

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Emanuel, Louis, cor. Second and Grant streets, Pittsburgh, Pa.

Emerson, Charles B., cor. Merrimac and Bridge streets, Haverhill, Mass.

Emerson, Isaac E., cor. Gilmor street and Lafayette avenue, Baltimore, Md.

Emich, Columbus V., No. 136 North Howard street, Baltimore, Md.

England, Robert, No. 800 South Tenth street, Philadelphia, Pa.

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Estey, Edwin M., Moncton, New Brunswick.

Evans, Henry S., Montreal, Canada.

Evans, Hugh W., Delphos, O.

Evans, Joseph S., P. O. Box 657, West Chester, Pa.

Evans, Samuel B., Circleville, O.

Faust, Charles, S. E. cor. Elm and Liberty streets, Cincinnati, O.

Featherston'h, Edward R., No. 1203 Chouttan avenue, St. Louis, Mo.

Feemster, Joseph H., No. 99 Walnut street, Cincinnati, O.

Feeny, James, Bay and Thompson streets, Stapleton, S. I., N. Y.

Fennel, Adolphus, cor. Eighth and Vine streets, Cincinnati, O.

Fenner, William R., care of W. D Hoyt & Co., Rome, Ga.

Fenton, Frank S., Beloit, Wis.

Ferdinand, George A., Dubuque, Ia.

Ferris, Charles E., Lawrenceburg, Ind.

Feth, Joseph G., cor. Madison and Columbia streets, Newport, Ky,

Fickling, Charles H., No. 1260 Thirty-second street, West Washington, D. C.

Field, Amos, No. 26 Vine street, Macon, Mo.

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Finley, Alexander K., New Orleans, La.

Finlay, John P., Greenville, Miss.

Fischer, Edward J., No. 570 Sedgwick street, Chicago, Ill.

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Fisher, Amos S., Bergen, N. Y.

Fisher, John N., Odd Fellows' Hall, Morristown, O.

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Fleck, Jacob J., cor. Washington and Perry streets, Tiffin, O.

Fleming, Frank B., No. 7 West Main street, Shippensburg, Pa.

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Follansbee, Sherman, No. 549 Shawmut avenue, Boston, Mass.

Ford, James M., Kansas City, Mo.

Ford, W. Thomas, No. 1305 Cherry street, Kansas City, Mo.

Foster, William O., Simcoe, Ontario, Can.

Fougera, C. Edmund, cor. Broadway and Thirtieth street, New York, N. Y.

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Fox, Daniel S., 323 Franklin street, Reading, Pa.

Fox, Peter P., No. 2300 Spruce street, Philadelphia, Pa.

Frames, James P., cor. Gay and Aisquith streets, Baltimore, Md.

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Franklin, Philip H., Marshall, Mo.

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Frauer, Herman E., No. 246 East Washington street, Indianapolis, Ind.

Frazee, George B., No. 69 Main street, Columbus, Miss.

French, George W., No. 360 Washington street, Boston, Mass.

French, William B., No. 10 State street, Albany, N. Y.

Frere, Alexander G., Main str., Franklin, La.

Frey, John, Bellevue Hospital, New York, N. Y.

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Frisby, Frank, Atchison, Kansas.

Frohwein, Richard, No. 122 First street, Elizabethport, N. J.

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Frothingham, Edward G., Jr., Elm street, cor. Main and Water, Haverhill, Mass.

Früh, Carl D. S., No. 2321 Ridge avenue, Philadelphia, Pa.

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Fuller, Henry W., No. 220 Randolph street, Chicago, Ill.

Fuller, Oliver F., No. 220 Randolph street, Chicago, Ill.

Gaillard, Edward, No. 1802 North Eleventh street, Philadelphia, Pa.

Gale, Edwin O., No. 85 South Clark street, Chicago, Ill.

Gale, William H., No. 85 South Clark street, Chicago, Ill.

Gallagher, Charles K., Second street, Washington, N. C.

Gallagher, John A., Kansas City, Mo.

Galt, Edward P., 34 Bond St., Selma, Ala.

Gardner, Charles H., New York, N. Y.

Gardner, Robert W., New York, N. Y.

Garrett, Oscar N., Joplin, Jasper county, Mo.

Garrigues, Samuel S., Ann Arbor, Mich.

Garrison, Herod D., No. 3510 Vincennes avenue, Chicago, Ill.

Gates, Howard E., Litchfield, Conn.

Gates, Amasa O., Morrisville, Vt.

Gaus, Charles H., No. 202 Washington avenue, Albany, N. Y.

Gaus, Louis H., No. 254 South Pearl street, Albany, N. Y.

Gaylord, Henry C., No. 110 Monument square, Cleveland, O.

Gegelein, Frederick L., Payne and Case avenues, Cleveland, O.

Geier, Oscar W., No. 175 Main street, Carrollton, Ky.

Gellatly, William A., No. 170 William street, New York.

Genois, Louis, No. 1412 Walnut street, Philadelphia, Pa.

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Gonaux, François, Houma, La.

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Goodale, Harvey G., No. 207 Atlantic avenue, Brooklyn, N. Y.

Goodale, Thomas T., No. 39 Tremont street, Boston, Mass.

Goodman, Charles F., No. 180 Farnham street, Omaha, Neb.

Goodman, Emanuel, cor. Sixth and Elm streets, Cincinnati, O.

Goodrich, Stephen, care of L. G. Moses & Co., Hartford, Conn.

Goodwin, Lester H., cor. State and Main streets, Hartford, Conn.

Gordon, William J. M., No. 142 Walnut street, Cincinnati, O.

Gorham, John R., Jr., No. 79 Water street, Newburgh, N. Y.

Gosman, Adam J., cor. Charles and Mulberry streets, Baltimore, Md.

Graham, William A., No. 30 Columbus avenue, Sandusky, O.

Graham, Willis H., No. 144 Main street, Zanesville, O.

Grahame, Israel J., cor. Twelfth and Filbert streets. Philadelphia, Pa.

Grandjean, Charles, No. 2828 North Fourteenth street, St. Louis, Mo.

Grandjean, Eugene, No. 2828 North Fourteenth street, St. Louis, Mo.

Gray, Gilbert D., Glenwood, Mo.

Gray, Henry R., No. 144 St. Lawrence Main street, Montreal, Quebec, Can.

Gray, William H.. No. 1139 Market street, Wheeling, W. Va.

Greene, William R., 1 Westminster street, Providence, R. I.

Gregory, Edmund, Kent street, Lindsay, Ontario, Canada.

Greve, Theodore L., cor. John and Sixth street, Cincinnati. O.

Greyer, Julius, S. W. cor. Vine and Findlay streets, Cincinnati, O.

Gridley, Junius, No. 87 Maiden Lane, New York, N. Y.

Griffith, Albert R., No. 33 Centre street, Oil City, Pa.

Griffith, Alphonzo De L., No. 33 Centre street, Oil City, Pa.

Griffith, Hiram E., Grant's Block, Niagara Falls, N. Y.

Griffith, William H., No. 146 Second avenue, New York, N. Y.

Griswold, De Witt C., Evansville, Wis.

Gross, Edward Z., No. 119 Market street, Harrisburg, Pa.

Groff, John E., care Caswell, Massey & Co., Newport, R. I.

Grossklauss, John F., cor. High street and Public Square, Navarre, O.

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Hall, Marshall C., care Hall Brothers, Fredericksburg, Va.

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Hamilton, Emil, No. 3037 Indiana avenue, Chicago, Ill.

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Hancock, John F., cor. Baltimore and Caroline streets, Baltimore, Md.

Hancock, John H., No. 182 Fulton street, New York, N. Y.

Hanson, Dominicus, Central Square, Rochester, N. Y.

Hanson, Willis T., No, 195 State street, Schenectady, N. Y.

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Hardigg, William L., Second near Main street, Uniontown, Ky.

Hardin, John H., Wilmington, N. C.

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Harper, Frank M., No. 45 East Main street, Madison, Ind.

Harper, Harry W., Fort Worth, Texas.

Harries, Oscar L., No. 263 Washington street, Buffalo, N. Y.

Harrington, Frank, Werland's Block, Main street, Logan, O.

Harrison, Jacob H., 305 Brady street, Davenport, Ia.

Hartness, William H., No. 109 Ontario street, Cleveland, O.

Hartshorn, Frederick A., Marlborough, Mass.

Hartung, Hugo R., No. 230 Fifteenth street, Denver, Col.

Hartwig, Charles F., Chicago, Ill.

Harwood, Frank L., Main street, Warren, Mass.

Hassencamp, Ferdinand, No. 75 Hanover street, Baltimore, Md.

Hassinger, Samuel E. R., N. E. cor. Fairmount avenue and Twenty-third street, Philadelphia, Pa.

Hatch, Eugene F., Goldsboro, N. C.

Hattenhauer, Robert C., Peru, Ill.

Hatton, Edgar M., cor. Main and Fifth streets, Zanesville, O.

Hauenstein, William, Bluffton, O.

Haviland, Henry, New York, N. Y.

Hawkins, Henry, cor. Hastings and Brewster streets, Detroit, Mich.

Hawkins, Joseph T., N. W. cor. Dearborn and Minor streets, Mobile, Ala.

Hawkins, M. Smith; No. 20 Broadway, Salem, Columbiana county, O.

Hay, Henry H., cor. Free and Middle streets, Portland, Me.

Hayes, Horace P., No. 312 Elk street, Buffalo, N. Y.

Hays, David, No. 207 Division street, New York, N. Y.

Hazen, Peter P., Cornwall, Orange county, N. Y.

Heagy, Weems A., Harrison street, Alexandria, Ind.

Hechler, George L., No. 774 Broadway, Cleveland, O.

Hegeman, J. Niven, 756 Broadway, New York, N. Y.
Heimstreet, Edward B., care of S. Heimstreet & Son, Janesville, Wis.
Heinemann, Otto, cor. Laurel and Lynn streets, Cincinnati, O.
HEINITSH, CHARLES A., No. 16 East King street, Lancaster, Pa.
Heintzeiman, Joseph A., cor. Ridge avenue and Master street, Philadelphia, Pa.
Helman, Charles M., cor. Findlay and Baymiller street, Cincinnati, O.
Hemm, Francis, South St. Louis, Mo.
Henderson, John, Toronto, Can.
Henes, William F., No. 221 Randolph street, Chicago, Ill.
Henry Charles (Dworniczak), Croton Landing, N. Y.
Hepburn, John, No. 93 Main street, Flushing, N. Y.
Herbruger, Florence C., Guatemala, U. S. of Colombia.
Herbst, Frederick W., Columbus, O.
Hermann, John G., cor. Baltimore and Mechanic streets, Cumberland, Md.
Hessen, George A., No. 220 Poplar street, Memphis, Tenn.
Heuermann, Henry W., No. 120½ Claiborne avenue, Chicago, Ill.
Heun, Emil, Cincinnati, O.
Heydenreich, Emile, No. 169 Atlantic avenue, Brooklyn, N. Y.
Heyl, James B., Vice-Consul, Hamilton, Bermuda.
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Higgins, James S., No. 24 De Lancey street, New York, N. Y.
Hildreth, Charles F., No. 54 Main street, Suncook, N. H.
Hildreth, Newton G., Cheviot, Cincinnati, O.
Hill, James W. H., Saugus, Mass.
Hilt, David, No. 84 Main street, Lafayette, Ind.
Hinsdale, Samuel J., Market Square, Fayetteville, N. C.
Hobart, Charles H., No. 10 Gold street, New York, N. Y.
Hodgetts, George, No. 305 Yonge street, Toronto, Ontario, Can.
Hoffmann, Frederick, No. 183 Broadway, New York, N. Y.
Hoffman, Otto L., cor. Fourth and Town streets, Columbus, O.
Hogan, Louis C., cor. Forty-seventh and State streets, Chicago, Ill.
Hogey, Julius H., No. 441 State street, Chicago, Ill.
Hogin, George B., Newton, Ia.
Hohenthal, Charles F. L., No. 857 Third avenue, New York, N. Y.
Hohly, Charles, No. 248 South St. Clair street, Toledo, O.
Holland, Samuel P., cor. Smithfield and Liberty streets, Pittsburgh, Pa.
Holmes, Clayton W., No. 122 Lake street, Elmira, N. Y.
Holmes, Henry E., No. 19 Main street, Walla-Walla, Wash. Ter.
Holzhauer, Charles, No. 787 Broad street, Newark, N. J.
Hood, Charles I., cor. Merrimac and Central streets, Lowell, Mass.
Hopp, Lewis C., cor. Euclid avenue and Erie street, Cleveland, O.
Hopper, George S., Hume, Allegheny county, N. Y.
Horn, Wilbur F., No. 32 West Main street, Carlisle, Pa.
Hoskinson, J. Thomas, Jr., Front and Norris streets, Philadelphia, Pa.
Hostetter, Charles M., No. 272 Penn avenue, Pittsburgh, Pa.
Hottendorf, Augustus, cor. Central avenue and Baymiller street, Cincinnati, O.
Howson, Walter H., Water street, Chillicothe, O.
Hoyt, George M., No. 61 Warren street, Boston, Mass.
Huber, Jacob C., No. 450 Main street, Fond du Lac, Wis.
Hubbard, George J., Manchester, N. H.
Hubbard, John H., No. 468 Harvard street, Cambridge, Mass.
Huddart, John F., Second and Chestnut streets, Louisville, Ky.
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Hudson, Arthur, Centre street, Newton, Mass.
Huested, Alfred B., No. 77 Eagle street, Albany, N. Y.
Hughes, Benjamin L., cor. Lama and Duval streets, Jacksonville, Fla.

Hunt, James L., cor. North and Main streets, Hingham, Mass.

Hunt, Leonard W., Fourth street, Macon, Ga.

Hurley, John, Monroe street, Little Falls, Herkimer county, N. Y.

Hurst, John C., Philadelphia, Pa.

Hurt, James F., Broadway, Columbia, Mo.

Hurty, John N., No. 104 North Penn street, Indianapolis, Ind.

Huston, Charles, No. 43 South High street, Columbus, O.

Hutchins, Isaiah, M. D., West Acton, Mass.

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Jacobs, Joseph, Marietta and Peachtree streets, Atlanta, Ga.

Jacobus, Judson S., cor. Thirty-first street, and Indiana avenue, Chicago, Ill.

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JACQUES, GEORGE W., cor. Broadway and Augusta street, S. Amboy, N. J.

James, George R., No. 120 Grand street, Schoolcraft, Mich.

James, William T., No. 103 Main street, Flushing, N. Y.

Jefferson, John H. B., No. 96 South Broadway, Baltimore, Md.

Jenkins, Luther L., No. 119 Leverett street, Boston, Mass.

Jenks, Thomas L., Merriman and Traverse streets, Boston, Mass.

Jenks, William J., No. 160 North Third street, Philadelphia, Pa.

Jennings, N. Hynson, No. 90 North Charles street, Baltimore, Md.

Jesson, Jacob, cor. Western avenue and Jefferson street, Muskegon, Michigan.

Johnson, Benjamin F., No. 301 East Girard avenue, Philadelphia, Pa.

Johnson, Charles B., Third street, Middletown, O.

Johnson, Edward L., Tenth avenue, cor. One Hundred and Fifty seventh street, New York, N. Y.

Johnson, Horace J., 1 Rumford Building, Main street, Waltham, Mass.

Johnson, Stuart W., Toronto, Ontario, Can.

Johnson, William, Nos. 153 and 155 Jefferson avenue, Detroit, Mich.

Jones, Alexander H., Ninth and Parrish streets, Philadelphia, Pa.

Jones, Charles K., Leffingwell and Washington avenue, St. Louis, Mo.

Jones, Daniel S., Twelfth and Spruce streets, Philadelphia, Pa.

Jones, Edward C., S. E. cor. Fifteenth and Market streets, Philadelphia, Pa.

Jones, James T., No. 855 East Fourth street, Boston, Mass.

Jones, John R., Mankato, Minn.

Jones, Simon N., First and Jefferson streets, Louisville, Ky.

Jones, Thomas, No. 1060 and 1062 Fulton street, Brooklyn, N. Y.

Jordan, F. Francis, Court-house Square, Goodrich, Ontario, Can.

Jordan, William H., No. 653 Congress street, Portland, Me.

Joy, Edwin W., Post and Mason streets, San Francisco, Cal.

JUDGE, JOHN F., near cor. Court and Cutter streets, Cincinnati, O.

Jungmann, Julius, New York, N. Y.

Kadlec, Lawrence W., No. 136 W. Twelfth street, Chicago, Ill.

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Kannal, Emmet, Rensselaer, Ind.

Karl, George J., No. 196 East Friend street, Columbus, O.

Karch, Joseph L., Ninth and Cumberland streets, Lebanon, Pa.

Karrman, William, Cincinnati, O.

Kauffman, George B., No. 47 East Spring street, Columbus, O.

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Kelley, Edward S., Boylston and Berkeley streets, Boston, Mass.

Kellog, Gardner, Mill and Commercial streets, Seattle, Wash. Ter.

Kelly, George A., Pittsburgh, Pa.

Kennard, Frank W., No. 1312 Harney street, Omaha, Neb.

Kennedy, George W., No. 103 North Centre street, Pottsville, Pa.

Kennedy, Thomas, Broadway, New Brighton, Pa.

Kent, Henry A., Jr., cor. E. Broad street and Jefferson avenue, Elizabeth, N. J.

Kent, Robert R., Opopka, Orange county, Fla.

Keppler, Christian L., No. 461 Dryades street, New Orleans, La.

Kerr, James, Sr., No. 56 Springfield street, Pittsburgh, Pa.

Kessler, Edward F., cor. Twentieth and Market streets, Louisville, Ky.

Keys, Roger, Twelfth and Pine streets, Philadelphia, Pa.

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Kimmel, Henry, No. 65 Avenue A, New York, N. Y.

KING, JAMES T., Main and South streets, Middletown, N. Y.

King, Walter B., No. 47 Austin avenue, Waco, Tex.

Kirchhofer, P. Paul, Massillon, Stark county, O.

Kitchen, Charles W., cor. Fulton and Washington streets, Brooklyn, N. Y.

Klie, G. H. Charles, Bellefontaine road, Lowell, N. St. Louis, Mo.

Kline, Mahlon N., Nos. 309 and 311 North Third street, Philadelphia, Pa.

Klump, Charles C., Allentown, Lehigh county, Pa.

KLUSSMANN, HERMANN, cor. Fourth street and Lafayette avenue, Hoboken, N. J.

Knabe, Gus. A., No 484 Pennsylvania avenue, Washington, D. C.

Knapp, Frank F., No. 362 Hudson street, New York, N. Y.

Knight, George E., No. 12 Liberty street, Bath, N. Y.

Knock, Thomas F., Petersburg, Va.

Knoebel, Edmund, Public Square, Highland, Ill.

Knoefel, August, New Albany, Ind.

Koch, Louis, cor. Fourth and Wood streets, Philadelphia, Pa.

Koehnken, Herman H., cor. Third and Mill streets, Cincinnati, O.

Krehbiel, Gustavus, No. 156 East Forty-eighth street, New York, N. Y.

Krewson, William E., cor. Eighth and Montgomery streets, Philadelphia, Pa.

Krieger, Philip, cor. Myrtle and Marcey streets, Brooklyn, N. Y.

Kuerze, Robert M., N. W. cor. Eighth and Depot streets, Cincinnati, O.

Kuhn, Norman A., No. 124 South Fifteenth street, Omaha, Neb.

Kurfurst, Henry F., West Liberty, Logan county, O.

Laber, Julius, No. 874 Third avenue, New York, N. Y.

Lahme, Charles A., Kansas City, Mo.

Laird, William R., No. 250 Washington street, Jersey City, N. J.

Lambert, John A., No. 450 West Michigan street, Indianapolis, Ind.

Lammert, C. Joseph, No. 32 Milton street, Cincinnati, O.

Land, Robert H., No. 270 Broad street, Augusta, Ga.

Lander, John C., Yorkville, Toronto, Can.

Lattimer, Robert F., No. 74 Elm street, Westerly, R. I.

Lauer, Michael J., No. 275 Mulberry street, Baltimore, Md.

Laurent, Eugene L., No. 27 Cedar street, Nashville, Tenn.

Lautenbach, Robert, cor. Eutaw and Saratoga streets, Baltimore, Md.

Lavigne, Jean B., No. 265 North Poydras street, New Orleans, La.

Lawton, Charles H., No. 91 Union street, New Bedford, Mass.

Lawton, Horace A., No. 91 Union street, New Bedford, Mass.

Laycock, Washington, No. 44 Union avenue, Rondout, N. Y.

Lazell, Lewis T., No. 10 Gold street, New York, N. Y.

Leary, Jeremiah T., No. 239 West Broadway, Boston, Mass.

Lee, James A., Main str., New Iberia, La.

Lee, James H., Court Square, Ashville, N. C.

Lehn, Louis, No. 160 William street, New York, N. Y.

Leis, George, No. 90 Massachusetts street, Lawrence, Kan.

Leist, Jacob L., Napoleon, O.

Leitch, Arthur, care of E. Shendell, St. Louis, Mo.

Leith, Harvey J., 282 North Main street, Providence, R. I.

Lemberger, Joseph L., No. 8 North Ninth street, Lebanon, Pa.

Lengfeld, Abraham L., cor. Gay and Stockton streets, San Francisco, Cal.

Levy, Adolph, No. 125 Grand street, E. D., Brooklyn, N. Y.

Lewis, Benjamin, No. 21 Canal street, New Orleans, La.

Lewis, Elam C., No. 2 West, cor. Merchants' Row, Rutland, Vt.

Lewis, Samuel E., Fourteenth and P streets, N. W., Washington, D. C.

Libby, Henry T., Main street, Pittsfield, Me.

Lillie, Charles H., Main street, Great Barrington, Mass.

Lilly, Eli, No. 36 South Meridian street, Indianapolis, Ind.

Lincoln, Henry W., No. 185 Warren street, Boston, Mass.

Linden, Hugo, F., Superior and Broad streets, Cleveland, O.

Linn, William B., cor. Waverly Place and Christopher street, Northern Dispensary, New York, N. Y.

Lins, Albert H., No. 86 Second avenue, New York, N. Y.

Little, James, Harrisonburg, Va.

Livingston, Barent V. B., No. 306 Broadway, Brooklyn, N. Y.

Llewellyn, John F., west side Public Square, Mexico, Adrian county, Mo.

Lloyd, John U., cor. Court and Plum streets, Cincinnati, O.

Lobstein, S. F. Daniel, Main street, Sag Harbor, N. Y.

Lockhart, George B., cor. Thirty-second and O streets, West Washington, D. C.

Lockwood, Samuel A., cor. Broad and White streets, Red Bank, Monmouth county, N. J.

Lohman, George H., No. 1 Mitchell's Block, Kendallville, Ind.

Loomis, John C., cor. Chestnut and Wall streets, Jeffersonville, Ind.

Lord, Thomas, No. 72 Wabash avenue, Chicago, Ill.

Love, Charles E., No. 544 Main street, Kansas City, Mo.

Loveland, William F., No. 213 Bread street, Elizabeth, N. J.

Lowd, John C., No. 43 Temple Place, Boston, Mass.

Lowden, John, No. 18 De Breseles street, Toronto, Can.

Luce, Edgar H., No. 61 Warren street, Boston, Mass.

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Lull, George E,, Manchester, N. H.

Luscomb, Will. E., No. 310 Essex street, Salem, Mass.

Lynn, Winfield S., Indianapolis, Ind.

Lyon, C. Wesley, Spring Valley, O.

Lyons, Isaac L., Nos. 42 and 44 Camp street, New Orleans, La.

McCaffrey, James, No. 274 Main street, Cambridge City, Wayne county, O.

McCalunn, Neil A., Strong, Kan.

McClure, Archibald, Nos. 74 and 76 State street, Albany, N. Y.

McClure, William H., Nos. 74 and 76 State street, Albany, N. Y.

McCollough, Winfield S., No. 1346 Jacob street, Wheeling, W. Va.

McConville, Thomas A., Macon, Ga.

McElhenie, Thomas D., No. 259 Ryerson street, Brooklyn, N. Y.

McIlhenny, John K., Wilmington, N. C.

McIntyre, Byron F., No. 99 North Moore street, New York, N. Y.

McIntyre, Ewen, No. 874 Broadway, New York, N. Y.

McIntyre, William, No. 2229 Frankford avenue, Philadelphia, Pa.

McKelway, George J., No. 1410 Chestnut street, Philadelphia, Pa.

McKenney, Jesse F., Shelbyville, Ky.

McKesson, John, Jr., No. 91 Fulton street, New York, N. Y.

McKimmie, George D., Detroit, Mich.

McLeod, Roderick, Quebec, Can.
McLelland, Robert C., Main str., Bryan, Tex.
McNeil, John M., Broadway, Scottdale, Westmoreland county, Pa.
McPherson, George, Chicago, Ill.
Mack, Adolph, No. 11 Front street, San Francisco, Cal.
Maclagan, Henry, No. 91 Fulton street, New York, N. Y.
Macmahan, Thomas J., No. 142 Sixth avenue, New York, N. Y.
Main, Thomas F., No. 278 Greenwich street, New York, N. Y.
MAISCH, JOHN M., No. 145 North Tenth street, Philadelphia, Pa.
Major, John R., No. 800 Seventh street, Washington, D. C.
Major, Oscar, Clinton, Ia.
Mallinckrodt, Edward, cor. Mallinckrodt and Main streets, St. Louis, Mo.
Mangold, Gustavus A., No. 4 East State street, Trenton, N. J.
Markoe, George F. H., cor. Warren and Dudley streets, Boston, Mass.
Marquardt, Jacob F., No. 60 Washington street, Tiffin, O.
Marshall, Ernest C., No. 51 Vine street, Charlestown, Mass.
Marshall. Hubert J., S. W. cor. Second and Main streets, Aurora, Ind.
Marsteller, George L., No. 231 King street, Charleston, S. C.
Martin, Charles C., Lewisport, Ky.
Martin, Emil, Russell avenue and South Meridian street, Indianapolis, Ind.
Martin, Hugo W. C., Chicago, Ill.
Martin, John C., U. S. Naval Dispensary, Washington, D. C.
Martin, William J., Cincinnati, O.
Masi, Frederick H., Main and Granby streets, Norfolk, Va.
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Masters, Robert S., Main street, Kentville, Nova Scotia.
Mattison, Richard V., No. 332 North Front street, Philadelphia, Pa.
May, Arthur F., Cleveland, O.
May, James O., Post-office Block, Water street, Naugatuck, Conn.
Mayell, Alfred, cor. Euclid avenue and Erie street, Cleveland, O.
Maynard, Henry S., No. 626 West Lake street, Chicago, Ill.
Mehringer, Joseph A., Jasper, Ind.
Meininger, Albert, cor. Vine and Twelfth streets, Cincinnati, O.
Melchers, Henry, cor. Genesee and Jefferson streets, East Saginaw, Mich.
Mellon, John J., No. 42 Camp street, New Orleans, La.
Mellor, Alfred, No. 218 North Twenty-second street, Philadelphia, Pa.
Melvin, J. Lacy, Main and Pearl streets, Westville, Conn.
Melvin, James S., No. 43 Temple Place, Boston, Mass.
Menard, Robert P., Hot Springs, Ark.
Menkemeller, Charles, cor. Twenty-second and Market streets, Wheeling, W. Va.
Menninger, Henry J., No. 97 Sands street, Brooklyn, N. Y.
Merrell, George, No. 5 West Fifth street, Cincinnati, O.
MERRILL, CHARLES A., No. 52 Water street, Exeter, N. H.
Metcalf, Theodore, No. 29 Tremont street, Boston, Mass.
Metzner, Adolph, No. 94 East Washington street, Indianapolis, Ind.
Meyer, Christian F. G., No. 8 North Second street, St. Louis, Mo.
Meyers, Edward T., No. 16 Main street, Bethlehem, Pa.
Meyers, James A., Odd Fellows' Hall, Columbia, Pa.
Michaelis, Charles O., cor. King and Cannon streets, Charleston, S. C.
Michaelis, Gustavus, No. 1 Myrtle avenue, Albany, N. Y.
Milburn, John A., No. 1101 F street, N. W. Washington, D. C.
Milburn, Washington C, No. 1429 Pennsylvania avenue, N. W., Washington. D. C.
Milhau, Edward L., No. 183 Broadway, New York, N. Y.
Miller, Adolphus W., cor. Third and Callowhill streets, Philadelphia, Pa.
Miller, Charles E., cor. Illinois and Market streets, Indianapolis, Ind.
Miller, Frederick C., cor. Clay and Market streets, Louisville, Ky.
Miller, George Y., No. 2 River street, Luzerne, Warren county, N. Y.

Miller, Jacob A., cor. Second and Chestnut streets, Harrisburg, Pa.

Miller, Jason A., Gloversville, N. Y.

Miller, Robert McCleferty, Malone, N. Y.

Milligan, Decatur, No. 509 North Second street, Philadelphia, Pa.

Milliner, William T., Union street, Spencerport, N. Y.

Miner, Maurice A., Wisconsin street, Geneva, Wis.

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Mohr, Charles, No. 177 Dauphin street, Mobile, Ala.

Moise, Benjamin F., No. 130 Meeting street, Charleston, S. C.

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Moore, J. Faris, Howard and Madison streets, Baltimore, Md.

Moore, James P., No. 62 Lake street, Chicago, Ill.

Moore, James S., West Stockbridge, Mass.

Moore, Joachim B., Thirteenth and Lombard streets, Philadelphia, Pa.

Moore, Silas H., No. 80 Fourth street, Sioux City, Iowa.

Moore, Thomas F., Mobile, Ala.

Moore, Arthur J., Sioux City, Iowa.

Moorhead, William W., cor. Broad and South streets, Philadelphia, Pa.

Morgan, Benjamin G., Main and Jackson streets, Hyde Park, Pa.

Morgan, James, Ypsilanti, Mich.

Morgan, Richard E., No. 135 High street, Holyoke, Mass.

Morley, William J., No. 207 East Pecan street, Austin, Texas.

Morrell, Mary H., Winterport, Me.

Morrill, Benjamin, Blue Hill, Me.

Morris, Lemuel I., No. 3 Broglie Platz, Strassburg, Germany.

Morris, Thomas H., Shreveport, La.

Morrison, Thomas O., No. 262 Eighth avenue, New York, N. Y.

Mott, George F., Catskill, Greene county, N. Y.

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Mueller, Louis H., No. 249 East Washington street, Indianapolis, Ind.

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Murray, Francis M., Bluffton, Allen co., O.

Murray, Talbot C., No. 513 Second street N. W., Washington, D. C.

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Myers, Daniel, Cleveland, O.

Nagle, Asher C., Bridge street, Wheeling, W. Va.

Nattans, Arthur, cor. Second and D streets, N. W., Washington, D. C.

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Newman, Alcuin E., Hot Springs, Ark.

Newman, George A., cor. Fifth and Walnut streets, Louisville, Ky.

Newman, George A., No. 380 Myrtle avenue, Brooklyn, N. Y.

Newton, John, No. 36 Beekman street, New York, N. Y.

Nichols, Edward P., Killingworth, Conn.

Nichols, Thomas B., No. 159½ Essex street, Salem, Mass.

Nick, Frederick, No. 1726 Peach street, Erie, Pa.

Nicot, Louis E., No. 65 Union avenue, Brooklyn, N. Y.

Niebrugge, John A., No. 506 Bedford avenue, Brooklyn, N. Y.

Nienstaedt, Hermann, Minnesota Soap Co., Minneapolis, Minn.
Nipgen, John A., Chillicothe, O.
Nisbet, William W., Washington avenue, Pittsburg, Pa.
Noble, John J., Centre and Pelham streets, Newton Centre, Mass.
Noyes, Daniel R., St. Paul, Minn.
Oatman, Le Roy S., No. 5 Commercial street, Angola, Erie county, N. Y.
Oberdeener, Moses, Santa Clara, Cal.
O'Brien, James J., No. 53 Kneeland street, Boston, Mass.
O'Brien, John W., No. 1727 Cass avenue, St. Louis, Mo.
O'Neil, Henry M., No. 463 Hudson street, New York, N. Y.
Ohliger, Lewis P., No. 23 West Liberty street, Wooster, O.
Oldberg, Oscar, St. Louis, Mo.
Oleson, Olaf M., Market str., Fort Dodge, Ia.
Oliver, William M., No. 132 Broad street, Elizabeth, N. J.
Ollif, James H., No. 855 Fulton street, Brooklyn, N. Y.
Orne, Charles P., No, 493 Main street, Cambridgeport, Mass.
Orne, Joel S., No. 493 Main street, Cambridgeport, Mass.
Osann, Bernard, No. 107 Fourth avenue, New York, N. Y.
Osgood, Hugh H., No. 148 Main street, Norwich, Conn.
Osmun, Charles A., No. 13 Seventh avenue, New York, N. Y.
Ottinger, James J., Twentieth and Spruce streets, Philadelphia, Pa.
Otto, Charles H., No. 157 Prince street, New York, N. Y.
Owens, James A., No. 45 Dominick street, Rome, N. Y.
Owens, Richard J., cor. Myrtle and Spencer streets, Brooklyn, N. Y.
Oxley, Jefferson, Nicholasville, Ky.
Paine, James D., No. 18 Buffalo street, Rochester, N. Y.
Paine, Milton K, cor. Main and State streets, Windsor, Vt.
Painter, Emlen, No. 522 Franklin street, Philadelphia, Pa.
Panknin, Charles F., No. 123 Meeting street, Charleston, S. C.
Parcher, George A., Main street, Ellsworth, Me.
Parker, George H., Draper's Block, Main street, Andover, Mass.
Parker, John H., No. 63 West Main street, Meriden, Conn.
Parr, John C., Main street, Weston, Mo.
Parrish, Clemmons, No. 72 Henry street, Brooklyn, N. Y.
Parrish, Dillwyn, No. 1017 Cherry street, Philadelphia, Pa.
Parsons, Henry B., No. 170 William street, New York, N. Y.
Parsons, John, No. 684 Wabash avenue, Chicago, Ill.
Parsons, Richard, No. 182 Ontario street, Cleveland, O.
Parsons, Robert E., No. 19 Main street, Orange. N. J.
Partridge, Charles K., Granite Block, Augusta, Me.
Patch, Edgar L., No. 90 Green street, Boston, Mass.
Patten, I. Bartlett, No. 39 Harrison street, Boston, Mass.
Patton, John Franklin. York, Pa.
Patterson, James L., cor. Twenty-first street and Ridge avenue, Philadelphia, Pa.
Pauley, Frank C., cor. Eastern street and Compton avenue, St. Louis, Mo.
Peabody, William H., No. 8 South Division street, Buffalo, N. Y.
Pearce, James H., No. 19 Front street, W. Toronto, Canada.
Pease, Francis M., Lee, Mass.
Peck, George L., Jamaica, N. Y.
Peixotto, Moses L. M., No. 543 Fifth avenue, New York, N. Y.
Penfold, Henry J., No. 5 Commercial street, Angola, Erie county, N. Y.
Pennington, T. H. Sands, No. 400 Broadway, Saratoga, N. Y.
Penrose, Stephen F., S. E. cor. Main and Broad streets, Quakertown, Pa.
Perkins, Benjamin A., Nos. 74 and 76 Commercial street, Portland, Me.
Perkins, Elisha H., cor. Green and Baltimore streets, Baltimore, Md.
Perkins, William A., No. 84 South C street, Virginia City, Nev.
Perot, T. Morris, No. 1810 Pine street, Philadelphia, Pa.

Perry, Bayard T., No. 1088 Elm street, Manchester, N. H.

Pettingill, Edward T., G and Twenty-first streets, N. W., Washington, D. C.

Pettit, Henry M., Carrollton, Mo.

Pettit, Louis C., New Lisbon, O.

Pfingst, Edward C., cor. Third and Breckenridge streets, Louisville, Ky.

Pfingst, Ferdinand J., cor. Twentieth and Market streets, Louisville, Ky.

Pfingst, Henry A., cor. Eleventh and Market streets, Louisville, Ky.

Pfingsten, Gustavus, No. 6 Whitehall street. New York, N. Y.

Phelps, Dwight, opposite Methodist Church, West Winstead, Conn.

Phillips, Charles W., No. 484 Eastern avenue, Cincinnati, O.

Phillips, Walter F., Nos. 134, 136, and 138 Middle street, Portland, Me.

Phipps, John M., Day's Block, Main street, Monson, Mass.

Physick, Henry S., No. 905 Clay avenue, St. Louis, Mo.

Pierce, Frank W., Main street, Chester, Vt.

Pierce, William H., No. 2147 Washington street, Boston, Mass.

Pile, Gustavus, No. 770 Passyunk avenue, Philadelphia, Pa.

Pilsbury, Frank O., Walpole, Mass.

Pinkham, Alonzo T., Franklin Square, Dover, N. H.

Pitt, John R., Jr., No. 218 Main street, Middletown, Conn.

Plautz, C. Herman, No. 709 Milwaukee avenue, Chicago, Ill.

Plummer, David G., No. 6 Main street, Bradford, Stark county, Ill.

Plummer, Edwin M., Sterling, Rice county, Kan.

Plummer, William L., St. Louis, Mo.

Plummer, William P., Bradford, Stark county, Ill.

Poley, Francis H., Norristown, Pa.

Pollard, Frank W., Hot Springs, Ark.

Porter, Chiton S., Eminence, Ky.

Porter, Henry C., cor. Main and Pine streets, Towanda, Pa.

Porter, W. C., Greensboro, N. C.

Post, Elisha, cor. Main and Pine streets, Athens, N. Y.

Post, William H., No. 21 Ferry street, Newark, N. J.

Potterfield, Clarence A., Charleston, Kanawha county, W. Va.

Powell, Robert B., Eureka, Humboldt Bay, Cal.

Powell, Thomas W., No. 10 Houston street, Fort Worth, Tex.

Powell, William R., No. 91 Fulton street, New York, N. Y.

Power, Frederick B., University of Wisconsin, Madison, Wis.

Prall, Delbert E., Ottumwa, Ia.

Prentice, Frederick F., opposite Post-office, Janesville, Wis.

Prescott, Albert B., University of Michigan, Ann Arbor, Mich.

Prescott, Horace A., No. 307 Washington street, Boston, Mass.

Preston, Andrew P., State street, Portsmouth, N. H.

Preston, David, cor. Ninth and Lombard streets, Philadelphia, Pa.

Preuss, Edward A., No. 21 Spring street, Los Angeles, Cal.

Price, Charles H., Salem, Mass.

Priddy, Robert S., No. 19 Sandwich street, Windsor, Ontario, Canada.

Prieson, Adolph, Main and Desper streets, Lock Haven, Pa.

Procter, Wallace, cor. Ninth and Lombard streets, Philadelphia, Pa.

Punch, William F., No. 71 Dauphin street, Mobile, Ala.

Purcell, John B., No. 1216 East Main street, Richmond, Va.

Pursell, Howard, S. W. cor. Mill and Cedar streets, Bristol, Pa.

Pyle, Cyrus, No. 326 Fulton street, Brooklyn, N. Y.

Raas, Francis, Union and Hoyt streets, Brooklyn, N. Y.

Rackley, Benjamin F., Franklin Square and Charles street, Dover, N. H.

Rademaker, Hermann H., cor. Madison and Shelby streets, Louisville, Ky.

Ramsperger, Gustavus, No. 703 Fulton street, Brooklyn, N. Y.

Randall, George D., Railroad street, St. Johnsbury, Vt.

Rankin, Jesse W., Decatur and Pryor streets, Atlanta, Ga.

Rano, Charles O., No. 1872 Niagara street, Buffalo, N. Y.

Rapelye, Charles A., No. 605 Main street, Hartford, Conn.

Raser, John B., No. 164 North Eighth street, Reading, Pa.

Redsecker, Jacob H., Lebanon, Pa.

Reed, Isaac N., No. 139 Summit street, Toledo, O.

Reichardt, F. Alfred, No. 45 Maiden lane, New York, N. Y.

Reichenbach, Fred. F., N. W. cor. Fifth and Market streets, St. Louis, Mo.

Reinhold, William, No. 146 North Clark street, Chicago, Ill.

Reinlein, Paul, Washington, D. C.

Reiss, Edward C., 170 William street, New York, N. Y.

Remington, Joseph P., cor. Thirteenth and Walnut streets, Philadelphia, Pa.

Rendigs, Charles P., cor. Spring and Abigail streets, Cincinnati, O.

Renouff, James T., Main str., Winsted, Conn.

Renz, Fred. J., cor. Market and Floyd streets, Louisville, Ky.

Restieaux, Thomas, No. 29 Tremont street, Boston, Mass.

Reule, John, Lafayette, Ind.

Reum, Hermann F., cor. Fifth and Broadway, Cincinnati, O.

Reusch, Ernst, No. 164 Nevins street, Brooklyn, N. Y.

Reynolds, Charles E., U. S. Receiving Ship Colorado, Brooklyn, N. Y.

Reynolds, Howard P., cor. Front and Cherry streets, Plainfield, N. J.

Reynolds, John J., Flemingsburg, Ky.

Reynolds, William K., No. 254 Friendship street, Providence, R, I.

Rhoades, Stephen H., No. 88 Main street, Pittston, Pa.

Rice, Charles, Bellevue Hospital, N. Y.

Rich, Willis S., No. 57 Smith street, Brooklyn, N. Y,

Richardson, James, No. 2827 Locust street, St. Louis, Mo.

Richardson, J. Clifford, No. 704 North Main street, St. Louis, Mo.

Ricksecker, Theodore, No. 146 William street, New York, N. Y.

Rickey, Randal, No. 157 North Green street, Trenton, N. J.

Riddell, James A., Aurora, Ind.

Ridgway, Lemuel A., Mansfield, Tioga county, Pa.

Rieffenstahl, Julius, Buffalo, N. Y.

Riesenman, Joseph, Liberty street, Franklin, Pa.

Riley, Charles W., No. 1115 Race street, Philadelphia, Pa.

Risk. Clarence H., Charles and Read streets, Baltimore, Md.

Rittenhouse, Henry N., No. 218 North Twenty-second street, Philadelphia, Pa.

Robbins, Alonzo, cor. Eleventh and Vine streets, Philadelphia, Pa.

Robbins, Charles A., No. 91 Fulton street, New York, N. Y.

Robbins, Daniel C., No. 91 Fulton street, New York, N. Y.

Roberts, Daniel J., Peabody, Kan.

Rogers, Joseph, cor. Harford and Greenmount avenues, Baltimore, Md.

Robertson, Archibald C., Allegheny City, Pa.

Robinson, Frederick, Kenosha, Wis.

Robinson, James S., cor. Second and Madison streets, Memphis, Tenn.

Robinson, William S., Yorkville, Toronto, Ont., Can.

Roche, Edward M., No. 611 South Fifteenth street, Philadelphia, Pa.

Rockefeller, Lucius, Palisade avenue, Englewood, N J.

Rogers, Arthur H., Geneseo, N. Y.

Rogers, Wiley, cor. Fifteenth and Chestnut streets, Louisville, Ky.

Rogers, William H., North street, Middletown, N. Y.

Rollins, John F., Fort George, Fla.

Rolph, Charles W., Castile, Wyoming county, N. Y.

Rommel, Emanuel, Lockport, N. Y.

Ronnefeld, Theodore, No. 195 Gratiot street, Detroit, Mich.

Rose, Henry J., cor. Yonge and Queen streets, Toronto, Ont., Can.

Rosengarten, Mitchell G., cor. Seventeenth and Fitzwater streets, Philadelphia, Pa.

Rosenwasser, Nathan, No. 112 Superior street, Cleveland, O.

Ross, Ellison H., Adrian, Mich.

Roth, Eugene N., Market street, between Green and St. Louis strs., Thibodeaux, La.

Royce, Lucien M., No. 91 Fulton street, New York, N. Y.
Ruete, Theodore W., No. 379 Main street, Dubuque, Iowa.
Rumsey, Samuel L., No. 423 Main street, East Orange, N. J.
Runyon, Edward W., care of Redington & Co., San Francisco, Cal.
Ruppert, John, Cincinnati, O.
Russell, E. Walter, cor. Baltimore and Eutaw streets, Baltimore, Md.
Russell, Elias S., No. 69 Main street, Nashua, N. H.
Russell, Eugene J., cor. Army street and Canton avenue, Baltimore, Md.
Rust, William, No. 7 Peace street, New Brunswick, N. J.
Ryerson, Henry O., Newton, N. J.
Safford, William B., cor. Vance and Hernando streets, Memphis, Tenn.
Sander, Enno, cor. Nineteenth and South Eleventh streets, St. Louis, Mo.
Sanderson, Stephen Francis, Rochester, N. Y.
Sands, George G., No. 4 Vanderbilt avenue, New York, N. Y.
Sappington, Richard, No. 131 North Gay street, Baltimore, Md.
Sargent, Ezekiel H., No. 125 State street, Chicago, Ill.
Sauer, Louis W., Central avenue and Baymiller street, Cincinnati, O.
Saunders, Richard B., Chapel Hill, N. C.
Saunders, William, London, Ontario, Can.
Sautter, Louis, cor. South Pearl and Plain streets, Albany, N. Y.
Savage, Thomas J., Mobile, Ala.
Sayre, Edward A., No. 461 Myrtle avenue, Brooklyn, N. Y.
Sayre, Lucius E., 1800 Market street, Philadelphia, Pa.
Sayre, William H., cor. Warner and Orange streets, Newark, N. J.
Scala, William Franklin, No. 50 East Capitol street, Washington, D. C.
Schaaf, Justus H., cor. Second and Pine streets, Gallipolis, O.
Schafer, George H., No. 129 Front street, Fort Madison, Iowa.
Schaffle, Samuel W. W., Market street, Lewisburg, Pa.
Schafhirt, Adolph J., cor. First and H streets, Washington, D. C.
Schambs, George M., No. 104 Huntington street, Cleveland, O.
Scheffer, Emil, No. 145 Market street, Louisville, Ky.
Scheffer, Henry W., No. 218 Clark avenue, St. Louis, Mo.
Schellentrager, E. A., No. 717 St. Clair street, Cleveland, O.
Scherff, John P., Glenwood avenue and Washington street, Bloomfield, N. J.
Schermerhorn, Winfield S., Main street, Stillwater, Saratoga county, N. Y.
Schiemann, Edward B., cor. M and Walnut streets, Louisville, Ky.
Schlaepfer, Henry J., cor. Main and Second streets, Evansville, Ind.
Schley, Steiner, No. 16 West Patrick street, Frederick City, Md.
Schmidt, Florian C., Fulton avenue and Franklin street, Evansville, Ind.
Schmitt, Joseph M., No. 108 North avenue, Rochester, N. Y.
Schneider, Matthias M., No. 327 Carson street, Pittsburg, Pa.
Schœttlin, Albert J., No. 301 West Broadway, Louisville, Ky.
Scholtz, Edmund L., Denver, Col.
Schrader, Henry, No. 74 East Washington street, Indianapolis, Ind.
Schranck, Henry C., Nos. 437 and 439 East Water street, Milwaukee, Wis.
Schreck, Leo S., No. 114 John street, Cincinnati, O.
Schreiber, August, Odd Fellows' Hall, Eighth street, Tell City, Ind.
Schroder, Hermann, No. 525 Main street, Quincy, Ill.
Schueller, Ernst, No. 231 South High street, Columbus, O.
Schueller, Frederick W., Nos. 190 and 192 South High street, Columbus, O.
Schuerman, Frederick, Cincinnati, O.
Schumann, Peter J., Whitehall and Hunter streets, Atlanta, Ga.
Schumann, Theodore, cor. Whitehall and Hunter streets, Atlanta, Ga.
Schwartz, John C., Hamilton, O.
Scofield, James S., Ninth avenue and Fifty-seventh street, New York, N. Y.
Scott, George T., Worcester, Mass.
Scott, Nelson R., cor. Main and Southridge streets, Worcester, Mass.

Scott, William H., No. 1617 Seventeenth street, Richmond, Va.
Scott, William J., No. 257 Prospect street, Cleveland, O.
Scoville, Charles H., 3 South Canal street, Tonawanda, Erie county, N. Y.
Seabury, George J., No. 21 Platt street, New York, N. Y.
Searby, William M., No. 859 Market street, San Francisco, Cal.
Searle, Gideon D., Anderson, Ind.
Sechler, James C., No. 201 Mill street, Danville, Pa.
Sedberry, Bond E., Fayetteville, N. C.
Seitz, Oscar, Salina, Kan.
Senier, Frederick S., No. 1164 Humboldt avenue, Milwaukee, Wis.
Sennewald, Ferdinand W., No. 800 Hickory street, St. Louis, Mo.
Serodino, Herman, Cincinnati, O.
Sevin, N. Douglas, No. 141 Main street, Norwich, Conn.
Sewald, David J., Dorchester avenue and Adam street, Boston, Mass.
Seward, Richard, St. James Hotel, Denver, Col.
Sharp, Alpheus P., cor. Pratt and Howard streets, Baltimore, Md.
Sharples, Stephen P., No. 114 State street, Boston, Mass.
Shaw, Robert J., No. 3 East Front street, Plainfield, N. J.
Shead, Edward E., No. 8 Water street, Eastport, Me.
Shearer, Edward Y., No. 1103 Second avenue, New York, N. Y.
Shedd, Edwin W., No. 61 Warren street, Boston, Mass.
Shedden, John W., No. 1275 Broadway, New York, N. Y.
Sheils, George E., No. 896 Broadway, New York, N. Y.
SHEPPARD, SAMUEL A. D., No. 1129 Washington street, Boston, Mass.
Sherwood, Hezekiah S., No. 459 Main street, Poughkeepsie, N. Y.
Sherwood, Louis W., No. 31 West Broad street, Columbus, O.
Shinn, James T., cor. Broad and Spruce streets, Philadelphia, Pa.
Shivers, Charles, cor. Seventh and Spruce streets, Philadelphia, Pa.
Shoemaker, Richard M., cor. Fourth and Race streets, Philadelphia, Pa.
Short, J. Eagan, U. S. Naval Dispensatory, Washington, D. C.
Shrader, John L., Market street, Wappinger's Falls, N. Y.
Shreve, John A., Port Gibson, Miss.
Shriver, Henry, No. 53 Baltimore street, Cumberland, Md.
Shryer, Thomas W., No. 103 Baltimore street, Cumberland, Md.
Shryock, Allen, No. 1129 Mount Vernon street, Philadelphia, Pa.
Shurtleff, Israel A., No. 39 Elm street, New Bedford, Mass.
Siegemund, Charles A., No. 1553 Washington street, Boston, Mass.
Siegenthaler, Harvey N., No. 55 East Main street, Springfield, O.
Simmons, Karl, St. Paul, Minn.
Simms, Giles G. C., No. 1344 New York avenue, Washington, D. C.
Simpson, William, No. 33 Fayetteville street, Raleigh, N. C.
Simpson, William, No. 609 Davis street, San Francisco, Cal.
Simson, Francis C., care of Brown & Webb, Halifax, N. S.
Simpers, J. Wilmer, cor. Thirteenth street and Columbia avenue, Philadelphia, Pa.
Sitton, Charles E., No. 151 First street, Portland, Oregon.
Skelly, James T., No. 339 East Fourteenth street, New York, N. Y.
Slater, Frank H., Main street, Matawan, Monmouth county, N. J.
Sloan, George W., Nos. 7 and 9 East Washington street, Indianapolis, Ind.
Slocum, Frank L., Fort Atkinson, Wis.
Slosson, Frank W., No. 223 Superior street, Cleveland, O.
Slosson, George, Coffeyville, Kan.
Smalley, Elijah, No. 271 Harrison avenue, Boston, Mass.
Smenner, J. Edwin, New Wilmington, Pa.
Smith, Arthur G., Belvidere, N. J.
Smith, Charles B., No. 861 Broad street, Newark, N. J.
Smith, Israel P., No. 324 Bank street, Newark, N. J.
Smith, J. Hungerford, Ausable Forks, N. Y.

Smith, Joseph S., No. 193 S. Howard street, Akron, O.
Smith, Linton, cor. Seventh and Market streets, Wilmington, Del.
Smith, S. Douglas, 526 Penn street, Reading, Pa.
Smith, Samuel H., Liberty street, Winston, N. C.
Smith, Willard, Rochester, N. Y.
Smith, Willard A., Main street, Richfield Springs, N. Y.
Smithnight, Albert, No. 135 Woodland avenue, Cleveland, O.
Sniteman, Charles C., Neillsville, Wis.
Snively, Andrew J., Centre Square, Hanover, York county, Pa.
Snow, Charles W., No. 28 East Genesee street, Syracuse, N. Y.
Snow, Jesse W., No. 23 Charles street, Boston, Mass.
Snyder, Alva L., 33 Court Square, Bryan, O.
Snyder, Ambrose C., cor. Court and Atlantic avenue, Brooklyn, N. Y.
Sombart, John E., Boonville, Mo.
Somers, Frank G., No. 125 State street, Chicago, Ill.
Somers, George H., Canton, O.
Somers, Richard M., Seventeenth and Oxford streets, Philadelphia, Pa.
Spalding, Warren A., No. 19 Church street, New Haven, Conn.
Spannagel, Charles C., No. 1607 Ridge avenue, Philadelphia, Pa.
Spenzer, Peter I., No. 88 Garden street, Cleveland, O.
Sperry, Herman J., No. 151 Chapel street, New Haven, Conn.
Spieth, William F., No. 273 Woodland avenue, Cleveland, O.
Springer, William T., Louisville, Ky.
Squibb, Edward H., No. 36 Doughty street, Brooklyn, N. Y.
Squibb, Edward R., No. 36 Doughty street, Brooklyn, N. Y.
Stacey, Benjamin F., No. 51 Vine street, Charlestown, Mass.
Stahler, William, S. E. cor. Main and Swede streets, Norristown, Pa.
Staley, Michael S., Indianapolis, Ind.
Stam, Colin A., Chestertown, Md.
Stamford, William H., No. 256 Mulberry street, Newark, N. J.
Standford, William A., Florence, Kan.
Stanford, James W., Cuthbert, Ga.
Stanley, E. C., No. 6 Beach avenue, Auburn, N. Y.
Stanley, Frederick P., Atlanta, Ga.
Starr, Thomas, No. 313 Ninth avenue, New York, N. Y.
Steele, Henry, N. E. cor. Turk and Taylor streets, San Francisco, Cal.
Steele, James G., No. 316 Kearney street, San Francisco, Cal.
Stein, Jacob H., No. 803 Penn street, Reading, Pa.
Steinhauser, Frederick, Denver, Col.
Stevens, Luther F., Atlantic avenue cor. Court street, Brooklyn, N. Y.
Stierle, Adolph, No 302 East Seventh street, St. Paul, Minn.
Stoddart, Thomas, No. 84 E. Seneca street, Buffalo, N. Y.
Stowell, Daniel, No. 1045 Washington street, Boston, Mass.
Strachan, William E., No. 619 Third avenue, Brooklyn, N. Y.
Strassel, William, cor. Shelby and Broadway, Louisville, Ky.
Stuart, Ennere B., Peoria, Ill.
Sturtevant, T. Frank, Wyandotte, Kan.
Sutton, Peter P., cor. Floyd and Market streets, Louisville, Ky.
Sweet, Abel S., Jr., No. 2 Main street, Bangor, Me.
Sweet, Caldwell, Bangor, Me.
Sweet, Frederick K., No. 2 Main street, Lockport, N. Y.
Sweet, William S., Pike, N. Y.
Tartis, Alfred J., No. 62 Broadway, E. D., Brooklyn, N. Y.
Taylor, Alfred B., No. 31 South Eleventh street, Philadelphia, Pa.
Taylor, James H., No. 104 Thames street, Newport, R. I.
Taylor, John P., No. 99 Third street, New Bedford, Mass.
Test, Alfred W., cor. Second and Federal streets, Camden, N. Y.
Thatcher, Joseph H., No. 12 Market street, Portsmouth, N. H.
Thatcher, Hervey D., No. 12 Market Square, Potsdam, N. Y.
Thibodeaux, Joseph G., Main street, Thibodeaux, La.

Thomas, George M., Derry Station, Pa.

Thomas, James, Jr., opposite Maxwell House, Nashville, Tenn.

Thomas, Oscar E., No. 123 Richardson street, Columbia, S. C.

Thompson, Ebenezer K., No. 8 Diamond street, Titusville, Pa.

Thompson, Edward W., No. 181 Main street, New Britain, Conn.

Thompson, William B., No. 1700 Mount Vernon street, Philadelphia, Pa.

Thompson, William P., No. 5 West Baltimore street, Baltimore, Md.

Thompson, William S., No. 705 Fifteenth street, Washington, D. C.

Thompson, William S., No. 5 West Baltimore street, Baltimore, Md.

Thomsen, John J., Nos. 14 and 16 German street, Baltimore, Md.

Thomsen, John J., Jr., No. 18 McCulloh street, Baltimore, Md.

Thomson, William M., No. 309 North Third street, Philadelphia, Pa.

Thorn, Henry P., Medford, N. J.

Thornton, William E., cor. Baltimore and Harrison streets, Baltimore, Md.

Thorp, Abner, N. W. cor. Court and Plum streets, Cincinnati, O.

Thurber, Almon R., No. 134 Main street, Ashtabula, O.

Tiarks, Hermann, First street, Monticello, Iowa.

Tibbs, William H., No. 235 Main street, Buffalo, N. Y.

Tidball, Walton C., New York, N. Y.

Tiernan, Frank M., Mansion House, Roselle, N. J.

Tilyard, Charles S., cor. Green and Franklin streets, Baltimore, Md.

Tindall, Graham McF., No. 61 Commercial street, Aberdeen, Miss.

Tobey, Charles W., Troy, O.

Tomfohrde, John W., cor. Benton and West Eighteenth streets, St. Louis, Mo.

Tompkins, Orlando, Boston Theatre, Boston, Mass.

Tooker, William W., Sag Harbor, N. Y.

Topley, James, No. 166 Georgia street, Vallejo, Solano county, Cal.

Toulson, Melbourn A., Chestertown, Md.

Tower, Levi, Jr., No. 1681 Washington street, Boston, Mass.

Townley, William W, No. 765 Broad street, Newark, N. J.

Townsend, Abram R., Marshalltown, Iowa.

Trask, Charles M., White River Junction, Vt.

Trimble, Henry, 145 North Tenth street, Philadelphia, Pa.

Troth, Samuel F., No. 1019 Cherry street, Philadelphia, Pa.

Troupe, Theodore, Springfield, O.

Truax, Charles, Cedar Rapids, Linn county, Iowa.

Tscheppe, Adolph, No. 1010, Third avenue, New York city.

TUFTS, CHARLES A, No. 25 Washington street, Dover, N. H.

Turner, George H., No. 296 South Pearl street, Albany, N. Y.

Turner, Isaac W., No. 139 Wayne street, Jersey City, N. J.

Turner, T. Larkin, No. 390 Tremont street, Boston, Mass.

Tuska, David, Second avenue and Eighty-sixth street, New York, N. Y.

Twombly, John H., Masonic Block, Main street, Newmarket, N. H.

Tyson, Samuel E., No. 141 West street, Georgetown, D. C.

Ubert, Julius C., cor. Lee and Division streets, Brooklyn, N. Y.

Ude, George, No. 3610 North Tenth street, St. Louis, Mo.

Uhlich, Ferdinand G., No. 1401 Salisbury street, St. Louis, Mo.

Underhill, George F., cor. Main and School streets, Concord, N. H.

Underhill, Joseph G., No. 397 Classon avenue, Brooklyn, N. Y.

Underhill, William H., Haverhill, Mass.

Underwood, Charles G., cor. Lewis street and Maverick Square, Boston, Mass.

Urban, Jacob P., No. 356 Ontario street, Cleveland, O.

Van Alstyne, Franklin B., Kinderhook, N.Y.

Van Antwerp, Garet, No, 71 Dauphin street, Mobile, Ala.

Van Auken, Jerrie A., No. 125 Main street, Cloversville, N. Y.

Vandegrift, John A., No. 69 High street, Burlington, N. J.

Vander Emde, Reinhold, No. 323 Bowery, New York, N. Y.

Vandervoord, Ransford W., No. 482 Broad street, Newark, N. J.

Van Patten, William J., College street, Burlington, Vt.

Vansant, Robert H., Pitman avenue, Ocean Grove, N. J.

Van Winkle, Abraham W., No. 35 Clinton avenue, Newark, N. J.

Vars, Enoch W., Main street, Niantic, R. I.

Vaughan, P. W., Durham, Orange county, N. C.

Vaupel, Charles P., Cleveland, O.

Vernor, James, No. 235 Woodward avenue, Detroit, Mich.

Viallon, Paul L., Park and Front streets, Bayou Goula, La.

Vickery, William H., cor. Central and Orchard streets, Dover, N. H.

Vilter, Herman, McMicken avenue and Locust street, Cincinnati, O.

Vincent, William, No. 117 Broadway, Brooklyn, E. D., N. Y.

Vogeler, Adolph G., No. 445 N. Clerk street, Chicago, Ill.

Voorhees, William H., No. 21 Front street, Plainfield, N. J.

Vordick, August H., S. E., cor. Jefferson avenue and Benton street, St. Louis, Mo.

Vreeland, Cyrus E., Main street near Washington, Orange, N. J.

Wackerbarth, John, cor. Sands and Bridge streets, Brooklyn, N. Y.

Wagner, Henry, cor. Fourth and Elm streets, Cincinnati, O.

Wahmhoff, Julius H., Delphos, O.

Walbrach, Arthur, Denver, Col.

Walker, Anselle, Freehold, N. J.

Walker, Charles, Hannibal, Mo.

Walker, Francis W., Jr., New Brighton, Pa.

Walker, George, Girard, Kan.

Walker, William J., No. 74 State street, Albany, N. Y.

Walsh, Robert H., No. 1412 Walnut street, Philadelphia, Pa.

Walton, Harry C., Laurel and Cutter streets, Cincinnati, O.

Wrangler, Conrad D., Eastside, Waterloo, Ia.

Wanier, George S., No. 407 Eighth avenue, New York, N. Y.

Wardell, Robert C., Battle Creek, Mich.

Warne, Henry L., Mitchell, Dak. Ter.

Warner, William R., No. 1228 Market street, Philadelphia, Pa.

Warren, Mrs. Ella F., Bellville, Richland county, O.

Watjen, Herman J., Vincennes, Ind.

Waugh, George J., Stratford, Ontario, Canada.

Wayne, Edward S., No. 146 Broadway, Cincinnati, O.

Weaver, Charles A., cor. Fifth and Walnut streets, Des Moines, Ia.

Weaver, John A., Easton, Pa.

Webb, John A., No. 210 Madison avenue, Baltimore, Md.

Webb, McHenry, Powers House, Columbia, Mo.

Webb, William H., No. 556 North Sixteenth street, Philadelphia, Pa.

Webber, Joseph T., cor. Main and State streets, Springfield, Mass.

Weber, William, cor. Fifteenth and Thompson streets, Philadelphia, Pa.

Webster, Stephen, No. 63 Warren avenue, Boston, Mass.

Wehrly, Thomas M., No. 72 G street, N. W., Washington, D. C.

Weichsel, Franz, No. 602 Pearl street, Cleveland, O.

Weidemann, Charles A., No. 563 North Twenty-second street, Philadelphia, Pa.

Weinman, Oscar C., No. 173 Seventh avenue, N. Y.

Weiser, Albert, cor. St. Paul and Main streets, St. Paul, Minn.

Weiser, Emilius I., Decorah, Ia.

Welch, Leonard E.. cor. Broad and Washington streets, Albany, Ga.

Wellcome, Henry S., No. 8 Snow Hill, London, England.

Wells, Charles W., Maynard, Mass.

Wells, Ebenezer M., Houston street, Fort Worth, Texas.

Wells, Jacob D., cor. Fourth street and Central avenue, Cincinnati, O.

Wells, Romanta, No. 297 State street, New Haven, Conn.

Wendell, Henry E., cor. Third and George streets, Philadelphia, Pa.

Wendler, Robert F. W., No. 404 Atlantic avenue, Brooklyn, N. Y.

Wenzell, William T., No. 852 Market street, San Francisco, Cal.

West, Howell F., Main street, Fayette, Miss.

Westmann, F. H., No. 2744 Cass avenue, St. Louis, Mo.

Weusthoff, Otto S., No. 212 East Third street, Dayton, O.

Whall, Joseph S., No. 82 Hancock street, Quincy, Mass.

Wharton, John C., No. 38 Union street, Nashville, Tenn.

Wharton, William H., No. 38 Union street, Nashville, Tenn.

Wheeler, C. Gilbert, No. 81 Clark street, Chicago, Ill.

Wheeler, Leonard H., No. 74 State street, Albany, N. Y.

Wheeler, Lucien F., Waldo, Fla.

WHITE, AARON S., No. 59 High Street, Mount Holly, N. J.

White, George H., cor. Newark and Jersey avenues, Jersey City, N. J.

White, Philip A., No. 102 Gold streeet, New York, N. Y.

WHITFIELD, THOMAS, No. 240 Wabash avenue, Chicago, Ill.

Whiting, Frederick T., Main street, Great Barrington, Mass.

Whitman, Nelson S., No. 3 Merchants' Exchange, Nashua, N. H.

Whitney, Henry M., cor. Essex and Lawrence streets, Lawrence, Mass.

Wichelns, Frederick, Bowery and Fourth street, New York, N. Y.

Wickham, William H., No. 91 Fulton street, New York, N. Y.

Wiegand, Thomas S., No. 3742 Market street, Philadelphia, Pa.

Wienges, Conrad, cor. Coles and Fourth streets, Jersey City, N. J.

Wigert, Carl R., No. 213 Jefferson street, Burlington, Iowa.

Wilcox, Frederick, Apothecaries' Hall, Exchange Place, Waterbury, Conn.

Wilder, Graham, No. 181 Main street, Louisville, Ky.

Wilder, Hans M., 1008 Morgan street, Philadelphia, Pa.

Williams, Alfred N., 93 Market street, Parkersburg, W. Va.

Williams, Duane B., 16 Lincoln Square, Worcester, Mass.

Williams, John K., No. 391 Main street, Hartford, Conn.

Williams, Richard J. C., No. 2 Union Block, Cambridge, N. Y,

Williams, Richard W., Notre Dame street, Three Rivers, Quebec, Can.

Williams, William H., No. 659 Main street, Wheeling, W. Va.

Williamson, Edward J., Ninth and Franklin streets, St. Louis, Mo.

Wilson, Albert H., Penn street and Frankstown avenue, Pittsburg, Pa.

Wilson, Benjamin O., No. 28 Merchants' Row, Boston, Mass.

Wilson, Frank M., No. 133 Main street, Willimantic, Conn.

Wilson, Julius H., No. 125 Twenty-second street, Chicago, Ill.

Wilson, William, No. 106 Broadway, cor. Pine street, New York, N. Y.

Winkleman, John H., cor. Liberty and German streets, Baltimore, Md.

Winslow, Edwin C., No. 107 Main street, Danville, Ill.

Winslow, Samuel W., No. 33 Kingston street, Boston, Mass.

Winter, Jonas, No. 81 West Franklin street, Hagerstown, Md.

Wiseman, Henry A., Main street, Danville, Va.

Wohlfarth, Justin, No. 2002 Third avenue, New York, N. Y.

Wolfe, Nathaniel, No. 213 Market street, Wilkesbarre, Pa.

Wolff, Lawrence, No. 1201 Chestnut street, Philadelphia, Pa.

Woltersdorf, Louis, No. 171 Blue Island avenue, Chicago, Ill.

Wood, Alonzo F., No. 2 Church street, New Haven, Conn.

Wood, Edward S., No. 14 Chauncey street, Cambridge, Mass.

Wood, Mason B., East Providence, R. I.

Woodbridge, George W., No. 2 Faneuil Hall Square, Boston, Mass.

Woodruff, Roderick S., No. 91 Bank street, Waterbury, Conn.

Woodward, Samuel M., No. 91 North Charles street, Baltimore, Md.

Woodridge, Napoleon, Cedar Key, Fla.

Worthington, J. Willits, cor. Eleventh and Arch streets, Philadelphia, Pa.

Wrampelmeier, Theodore J., Ann Arbor, Mich.

Wright, Archibald W., cor. Front and Market streets, Philadelphia, Pa.

Wynn, William, No. 496 Fulton street, Brooklyn, N. Y.

Yatman, John L., Orange Valley. N. J.

Yeakel, Nathan W., Nos. 107 and 109 Columbia street, Lafayette, Ind.

Yorston, Matthew M., No. 429 Central avenue, Cincinnati, O.

Young, Alexander N., No. 103 Sixteenth street, Wheeling, W. Va.

Young, William, Park avenue, Rich Hill, Mo.

Young, Judson J., Kansas City, Mo.

Zahn, Emil A., No. 1801 State street, Chicago, Ill.

Zeilin, John H., No. 512 Cherry street, Philadelphia, Pa.

Zeller, William S., Bellefonte, Centre county, Pa.

Zellhœfer, George, No. 91 Fulton street, New York, N. Y.

Ziegler, Philip M., No. 526 Penn street, Reading, Pa.

Zimmerman, Charles, Peoria, Ill.

Zimmerman, John L., cor. Arch and Ray streets, Searcy, Ark.

Zoeller, Edward V., Tarboro, N. C.

Zwick, George G., cor. Eleventh and Meridian streets, Covington, Ky.

LIST OF DECEASED MEMBERS.

HONORARY MEMBERS.

		Elected.	Died.
Bache, Franklin, M. D.,	Philadelphia, Pa.,	1857	1864
Bailey, Montgomery J., M. D.,	New York, N. Y.,	1856	1873
Boullay, Pierre François Guillaume,	Paris, France,	1868	1869
Casselmann, Arthur, Ph. D.,	St. Petersburg, Russia,	1868	1872
Chevalier, Alphonse, M. D.,	Paris, France,	1871	1879
Deane, Henry,	London, England,	1868	1874
Durand, Elias,	Philadelphia, Pa.,	1857	1873
Farrington, Thomas,	Boston, Mass.,	1856	1867
Hanbury, Daniel,	London, England,	1868	1875
Ludwig, Hermann, Ph. D.,	Jena, Germany,	1871	1873
Mohr, Frederick, Ph. D.,	Bonn, Germany,	1868	1879
Robinet, Stephane,	Paris, France,	1868	1869
Smith, Daniel B. (President, 1852–53),	Philadelphia, Pa.,	1856	1883
Squire, Peter, F. L. S.,	London, England,	1882	1884
Wiggers, H. August L., Ph. D.,	Göttingen, Germany,	1877	1880
Wood, George B., M. D.,	Philadelphia, Pa.,	1857	1878

ACTIVE MEMBERS.

		Elected.	Died.
Adolph, Albert,	Columbus, O.,	1882	1883
Aimar, George Washington,	Charleston, S. C.,	1874	1877
Anderson, James H.,	New York, N. Y.,	1859	1866
Andrews, George Wansay (President 1856–57),	Baltimore, Md.,	1853	1877
Aspinwall, James S.,	New York, N. Y.,	1855	1874
Atwood, Charles Henry,	Boston, Mass.,	1856	1877
Bache, Charles L.,	San Francisco, Cal.,	1852	1854
Backus, James William,	Marine City, Mich.,	1867	1870
Badger, Charles William,	Newark, N. J.,	1870	1877
Balmer, James,	Baltimore, Md.,	1856	1880
Barry, John William,	Baltimore, Md.,	1856	1861
Baylis, William E. P.,	Brooklyn, N. Y.,	1860	1872
Baynon, John,	Shreveport, La.,	1858	1862
Beam, Isaac Richard,	Baltimore, Md.,	1873	1879
Bell, Alexander C.,	Chicago, Ill.,	1870	1881
Bell, Gotthold Emanuel,	Louisville, Ky.,	1874	1879
Benzinger, John Sylvester,	Baltimore, Md.,	1860	1869

		Elected.	Died.
Bertolett, William John,	Shreve, O.,	1872	1877
Betts, Howard Seeley,	Norwalk, Ct.,	1880	1883
Bidwell, Marshall Spring,	Elmira, N. Y.,	1871	1877
Bigelow, Francis O.,	Medford, Mass.,	1859	1863
Billings, Samuel J.,	New York, N. Y.,	1860	1865
Bingham, John Calvin,	St. Johnsbury, Vt.,	1853	1870
Blair, Henry C.,	Philadelphia, Pa.,	1855	1862
Blauw, Hippolyt Anton,	Rochester, N. Y.,	1856	1870
Bowman, Henry K.,	Philadelphia, Pa.,	1869	1873
Boyden, Ashel,	Boston, Mass.,	1853	1877
Bray, William Thomas,	Wingham, Ontario,	1881	1882
Bright, James Evesson,	Worcester, Mass.,	1868	1872
Bringhurst, Ferris,	Wilmington, Del.,	1862	1871
Brown, John T.,	Boston, Mass.,	1859	1860
Brown, William,	Boston, Mass.,	1858	1875
Canavan, Benjamin,	New York, N. Y.,	1855	1857
Carney, Charles Tibbits,	Boston, Mass.,	1853	1862
Caspari, Charles,	Baltimore, Md.,	1856	1870
Catlin, Thereon,	St. Louis, Mo.,	1871	1880
Chapman, William B. (President 1854–55),	Cincinnati, O.,	1852	1874
Cherot, Leonce,	Memphis, Tenn.,	1865	1879
Churchill, George Washington,	Chelsea, Mass.,	1865	1869
Clency, William F.,	Cincinnati, O.,	1859	1865
Coddington, Isaac,	New York City,	1855	1874
Colby, Moses D.,	Boston, Mass.,	1859	1870
Coon, Walter S.,	New York City,	1858	1861
Coppuck, Peter Van Pelt,	Mount Holly, N. J.,	1857	1869
Crawley, Francis Xavier,	St. Louis, Mo.,	1869	1882
Cressman, Noah,	Waterloo, Canada West,	1863	1864
Cunningham, James E.,	Pittsburgh, Pa.,	1860	1863
Cushman, Alexander,	New York City,	1858	1861
Daggett, Alfred, Jr.,	New Haven, Conn.,	1865	1878
Dalrymple, Charles Hoagland,	Morristown, N. J.,	1860	1882
Davies, Robert Jones,	Brooklyn, N. Y.,	1858	1872
De Motte, Henry Augustus,	Jersey City, N. J.,	1871	1873
D'Evers, Henry Gaston,	Chicago, Ill.,	1865	1870
Dodge, John P.,	New York, N. Y.,	1865	1873
Dover, Thomas,	Dayton, O.,	1879	1881
Drischler, Francis,	New York City,	1881	1882
Dunk, Alfred Allen,	East Saginaw, Mich.,	1867	1879
Easterbrook, Ray B.,	New York, N. Y.,	1858	1868
Ellis, Charles (President 1857–58),	Philadelphia, Pa.,	1852	1873
Emanuel, Louis M.,	Linwood, Pa.,	1857	1868
Erben, John Singer,	Philadelphia, Pa.,	1868	1881
Everson, John C.,	Philadelphia, Pa.,	1863	1872
Eyster, Christopher Edward,	Yankton, Dak.,	1871	1877
Faber, John,	New York, N. Y.,	1857	1881
Fish, George Brewster,	Saratoga Springs, N. Y.,	1860	1866
Fish, Henry Ferdinand,	New York, N. Y.,	1852	1868
Foley, James Thomas,	Houston, Texas,	1878	1879

		Elected.	Died.
Folger, William Swain,	Boston, Mass.,	1875	1878
Forester, Richard,	Brooklyn, N. Y.,	1860	1862
Fowle, Henry Dearborn,	Boston, Mass.,	1853	1882
Frohwein, Max,	New York, N. Y.,	1865	1877
Frohwein, Theobald,	New York, N. Y.,	1862	1883
Frost, John Johnson,	Lexington, Ky.,	1874	1880
Fulton, John Culpepper P.,	Brooklyn, N. Y.,	1873	1874
Gabaudan, Arthur W.,	New York City,	1862	1870
Gaither, Francis Singleton,	Washington, D. C.,	1860	1876
Gay, William,	Cambridgeport, Mass.,	1858	1862
Geiger, Conrad John,	Canton, O.,	1866	1876
Gerhard, John C.,	Cincinnati, O.,	1862	1865
Geyer, Andrew,	Boston, Mass.,	1853	1855
Gilman, Simuel Kinsman, Jr.,	Boston, Mass.,	1876	1879
Gleeson, James Andrew,	Boston, Mass.,	1859	1880
Gleeson, Michael Henry,	Boston, Mass.,	1859	1879
Goodwin, William W.,	Newburyport, Mass.,	1853	1877
Graefle, Frederick Alexander,	Baltimore, Md.,	1870	1873
Green, Thomas Townsend,	Poughkeepsie, N. Y.,	1858	1880
Griswold, William Henry,	North Adams, Mass.,	1874	1879
Groneweg, Louis,	Cincinnati, O.,	1864	1866
Haddox, James Bowling,	Nashville, Tenn.,	1876	1880
Harbaugh, Valentine,	Washington, D. C.,	1856	1871
Hardy, William Henry,	Clinton, Iowa,	1881	1884
Harwood, Lucian,	Warren, Mass.,	1875	1883
Hazard, Peter J.,	Philadelphia, Pa.,	1853	1876
Hegeman, Frederick Augustus,	New York,	1855	1860
Hegeman, William,	New York,	1858	1875
Henchman, Daniel,	Boston, Mass.,	1853	1878
Hensch, Hugo,	Cleveland, O.,	1872	1873
Hendel, Samuel Douglass,	St. Louis, Mo.,	1858	1871
Heydenreich, Frederick Victor,	Brooklyn, N. Y.,	1860	1879
Heyerdahl, Ulrich,	Faribault, Minn.,	1880	1882
Hill, Henry E.,	Detroit, Mich.,	1866	1868
Hollis, Thomas,	Boston, Mass.,	1853	1875
Hoagland, Pratt Ralph,	Boston, Mass.,	1867	1882
Hodge, Charles,	Portland, Or.,	1859	1881
Homann, James W.,	New York,	1875	1875
Howard, George Montgomerie,	Washington, D. C.,	1871	1877
Howarth, James L.,	Atlanta, Ga.,	1877	1881
Hughes, Henry Arnold,	Louisville, Ky.,	1857	1876
Huling, Bruce,	Cleveland, O.,	1873	1883
Hunt, Henry H.,	Balston Spa, N. Y.,	1876	1877
James, Thomas Potts,	Cambridge, Mass.,	1857	1882
Jardella, Jerome B.,	Vincennes, Ind.,	1865	1870
Jenkins, William Ellis,	Boston, Mass.,	1865	1869
John, Frederick L.,	Philadelphia, Pa.,	1856	1864
Johnston, Charles Pearson,	Memphis, Tenn.,	1868	1873
Junghanns, Charles A.,	Cincinnati, O.,	1858	1862
Kalb, Theodore,	St. Louis, Mo.,	1864	1882

		Elected.	Died.
Keffer, Frederick A.,	New Orleans, La.,	1862	1873
Kelsey, Henry, Jr.,	New Haven, Conn.,	1873	1883
Kennedy, Robert Chauncey,	Cleveland, O.,	1865	1868
Kent, Ashbury,	Cincinnati, O.,	1854	1860
Kent, William,	Cincinnati, O.,	1864	1867
Kettell, George Parker,	Charlestown, Mass.,	1867	1881
Kidder, Darius B.,	Boston, Mass.,	1858	1874
Kiersted, Henry Taylor (Pres. 1860–'62).	New York,	1856	1882
King, Alexander,	Buffalo, N. Y.,	1874	1876
King, Henry,	New York,	1858	1867
Knapp, Edwin Ezra,	Norwalk, Conn.,	1860	1862
Kolp, Christopher Henry,	Philadelphia, Pa.	1876	1878
Krebs, Hugo,	St. Louis, Mo.,	1871	1880
Krummeck, Jacob,	Santa Fe, New Mexico,	1867	1878
Laidley, Joseph,	Richmond, Va.,	1852	1861
Lancaster, Thomas A.,	Philadelphia, Pa.,	1859	1875
Lane, Alfred Samuel,	Rochester, N. Y.,	1857	1881
Lane, James Bacheller,	Fitchburg, Mass.,	1856	1867
Lehlbach, Paul F.,	New York, N. Y.,	1872	1884
Leitch, Alexander,	St. Louis, Mo.,	1858	1868
Lewis, Thomas,	Brooklyn, N. Y.,	1867	1880
Lineaweaver, Kline Cyrus,	Washington, D. C.,	1864	1873
Lingelbach, Ferdinand,	Louisville, Ky.,	1874	1879
Little, William B.,	Panama, U. S. Colombia,	1857	1867
Longshaw, William, Jr.,	Bayou Sara, La.	1858	1864
Luckenbach, Edward H.,	Bethlehem, Pa.,	1870	1883
Lyman, Benjamin,	Montreal, Can.,	1875	1878
Lyman. Stephen J.,	Montreal, Can.,	1875	1879
Lyon, Charles H., Jr.,	Boston, Mass.,	1858	1871
McBride, James,	St. Louis, Mo.,	1864	1871
McConville, Michael Stanislaus,	Worcester, Mass.,	1859	1873
McDonald, John,	Brooklyn, N. Y.,	1860	1861
McIntyre, Timothy Caldwell,	Washington, D. C.,	1858	1862
McKay, George Johnson,	Eureka, Cal.,	1864	1880
McPherson, George B.,	Cincinnati, O.,	1867	1871
Mallinckrodt, Gustavus,	St. Louis, Mo.,	1869	1877
Marsh, Edward H.,	New York, N. Y.,	1858	1884
Massot, Eugene Leon,	St. Louis, Mo.,	1857	1871
Matt, Joseph,	Columbus, O.,	1872	1874
Mattern, Jonathan Cunningham,	Pittsburgh, Pa.,	1860	1876
Maxwell, James T.,	New York, N. Y.,	1855	1860
Mayer, Ferdinand F.,	New York, N. Y.,	1859	1869
Meade, Richard Hardaway,	Richmond, Va.,	1873	1880
Meakim, John (President 1855–56),	New York, N. Y.,	1852	1863
Melzar, Augustus P.,	Wakefield, Mass.,	1856	1874
Menard, Alexander Ambrose,	Macon, Ga.,	1877	1881
Merrell, William Stanley,	Cincinnati, O.,	1854	1882
Merrick, John Mudge,	Boston, Mass.,	1875	1879
Metcalf, Tristam Walker,	Brooklyn, N. Y.,	1857	1873
Milhau, John (President 1867–68),	New York, N. Y.,	1855	1874

		Elected.	Died.
Mott, William,	Saginaw City, Mich.,	1869	1883
Muller, William Henry,	Chicago, Ill.,	1865	1870
Mundy, William Chester,	Seneca Falls, N. Y.,	1880	1881
Nagle, John George,	Baltimore, Md.,	1863	1869
Nairn, Joseph Wilson,	Washington, D. C.,	1858	1875
Nadand, James William,	Cincinnati, O.,	1864	1868
Neate, William Isaac Collier,	Olympia, W. T.,	1880	1881
Neergaard, John William,	New York, N. Y.,	1859	1880
Norgrave, Samuel Kramer,	Pittsburgh, Pa.,	1857	1871
O'Brien, Joseph Christopher,	Baltimore, Md.,	1863	1873
O'Gallagher, James,	St. Louis, Mo.,	1858	1882
Oliffe, William J.,	New York, N. Y.,	1858	1866
Osborn, William Henry,	Baltimore, Md.,	1870	1881
Osgood, Samuel W.,	Davenport, Iowa,	1858	1860
Palmer, Albert Gallatin,	Washington, D. C.,	1858	1860
Parker, Herschel,	Brooklyn, N. Y.,	1867	1870
Parrish, Edward (President 1868–69),	Philadelphia, Pa.,	1852	1872
Patten, John Frederick,	Bangor, Me.,	1871	1881
Peck, Sereno Parsons,	Bennington, Vt.,	1853	1859
Pettis, Newton C.,	North Adams, Mass.,	1868	1874
Philbrick, Samuel P.,	Boston, Mass.,	1852	1859
Phillips, Lewellyn,	Baltimore, Md.,	1856	1865
Pile, Wilson Hunt,	Philadelphia, Pa.,	1857	1881
Platzer, Robert,	Philadelphia, Pa.,	1865	1874
Plummer, George Bolton,	Hinsdale, Mass.,	1875	1882
Polhemus, James L.,	Sacramento, Cal.,	1866	1867
Pollard, Charles P.,	Marysville, Cal.,	1859	1869
Porter, Henry Clinton,	Towanda, Pa.,	1869	1877
Powers, Charles J.,	Syracuse, N. Y.,	1882	1883
Preston, Alfred J.,	Portland, Me.,	1873	1879
Procter, William, Jr. (President 1862–63),	Philadelphia, Pa.,	1852	1874
Pyle, James Lindley,	Brooklyn, N. Y.,	1859	1866
Rehfuss, Lewis,	Cincinnati, O.,	1854	1856
Reifsnider, William Edward,	Baltimore, Md.,	1864	1872
Reinold, Bernard H.,	New York, N.Y.,	1861	1875
Ricker, George Dexter,	Boston, Mass.,	1858	1881
Rideout, James William,	Brooklyn, N. Y.,	1875	1880
Ritson, Alfred,	Columbus, O.,	1870	1879
Roberts, David,	Boston, Mass.,	1858	1863
Rollmann, Frederick,	Philadelphia, Pa.,	1862	1864
Roemer, Daniel,	Cincinnati, O.,	1865	1870
Ross, George,	Lebanon, Pa.,	1878	1880
Sands, Jesse M.,	New York, N. Y.,	1860	1867
Schmidt, Henry,	New York, N. Y.,	1874	1875
Schmidt, William George,	Louisville, Ky.,	1874	1877
Scott, David,	Worcester, Mass.,	1855	1878
Scott, John,	Cincinnati, O.,	1854	1873
Scully, Harmar Denny,	Pittsburg, Pa ,	1858	1866
Selfridge, Matthew Merthirall,	Philadelphia, Pa.,	1858	1881
Shoemaker, Joseph Lybrand,	Philadelphia, Pa.,	1867	1880

		Elected.	Died.
Smith, Auburn,	London, O.,	1880	1882
Smith, Charles Augustus,	Cincinnati, O.,	1852	1862
Smith, Edward Alexander,	Baltimore, Md.,	1870	1875
Smith, Edwin R.,	Monmouth, Ill.,	1862	1869
Smith, John William,	Norfolk, Va.,	1873	1876
Smith, Samuel A.,	Newburyport, Mass.,	1859	1874
Smither, Charles,	Buffalo, N. Y.,	1881	1882
Snowdon, George M.,	Philadelphia, Pa.,	1857	1879
Squire, William Henry,	Germantown, Pa.,	1862	1865
Stabler, Rich. Hartshorne (Pres. 1870–71),	Alexandria, Va.,	1856	1878
Steiner, Henry,	Philadelphia, Pa.,	1857	1858
Stephen, William Gibson,	Yonkers, N. Y.,	1860	1878
Stevens, Ashbel Mead,	Cincinnati, O.,	1854	1860
Stevens, Rufus Walker,	Somersworth, N. H.,	1859	1868
Suding, Henry Aloysius,	Baltimore, Md.,	1870	1875
Sweetser, Thomas Augustus,	South Danvers, Mass.,	1859	1860
Talbot, Stephen Liversidge,	Providence, R. I.,	1882	1883
Taylor, Robert James,	Newport, R. I.,	1859	1871
Taylor, William,	Philadelphia, Pa.,	1868	1871
Thayer, Henry,	Cambridgeport, Mass.,	1858	1882
Thomas, William,	Jersey City, N. J.,	1856	1856
Tilden, Henry Augustus,	New Lebanon, N. Y.,	1858	1884
Toplis, Robert John,	Yonkers, N. Y.,	1863	1882
Tulley, Andrew J.,	New York, N. Y.,	1862	1875
Uhl, Charles,	Memphis, Tenn.,	1860	1873
Vreeland, Frank Louis,	San Francisco, Cal.,	1880	1883
Waite, Samuel Brett,	Washington, D. C.,	1858	1862
Warren, Charles Henry,	Brandon, Vt.,	1872	1876
Warren, William,	Brighton, Mass.,	1867	1871
Watson, William J.,	Brooklyn, N. Y.,	1853	1872
Weaver, James,	New York, N. Y.,	1860	1883
Weaver, Joseph Thornton,	Philadelphia, Pa.,	1868	1882
Weisman, Augustus William,	New York, N. Y.,	1869	1883
Weyman, George Washington,	Pittsburgh, Pa.,	1858	1864
White, Daniel Fuller,	Charlestown, Mass.,	1859	1864
White, William P.,	Chicago, Ill.,	1865	1866
Whitehead, Silas,	Lynchburg, Va.,	1856	1858
Wilkins, Daniel Gilbert,	Boston, Mass.,	1865	1880
Willard, Joseph,	Chicago, Ill.,	1865	1878
Wilson, Adam Hill,	Philadelphia, Pa.,	1859	1880
Wilson, George C.,	Boston, Mass.,	1859	1861
Wiseman, Charles,	Baltimore, Md.,	1856	1862
Witzell, Louis,	Cincinnati, O.,	1864	1867
Wood, Gilbert Davidge,	Baltimore, Md.,	1856	1863
Woods, Samuel H.,	Boston, Mass.,	1859	1869
Wright, George,	New York, N. Y.,	1869	1873
Wright, William R.,	Boston, Mass.,	1875	1883
Young, John Edward,	Vergennes, Vt.,	1875	1882

LIST OF RESIGNATIONS.

Name.	Residence.	Elected.
‡ Ball, Theophilus B.,	Ironton, Ohio,	1874
§ Colby, Albert L.,	New York, N. Y.,	1881
† Congdon, Albert J.,	East Greenwich, R. I.,	1860
§ Cool, J. Harris,	Palmyra, N. Y.	1882
‖ Creuse, Jules L. A.,	New York, N. Y.,	1871
† Harvey, Edmund,	Guelph, Ont.,	1877
§ Hebberling, Gottfried,	New York, N. Y.	1867
‖ Kay, Isaac H.,	Philadelphia, Pa.,	1870
§ Knowles, Harvey A.,	Toronto, Ont.,	1877
§ McDonald, George,	Kalamazoo, Mich.,	1871
§ Palmer, John D.,	Monticello, Fla.,	1875
† Plaisted, James H.,	Waterville, Me.,	1867
† Plummer, Henry S.,	Peckville, Pa.,	1881
† Proctor, Benjamin,	Lynn, Mass.,	1859
§ Sanderson, George H.,	Waltham, Mass.,	1880
§ Scattergood, George J.,	Philadelphia, Pa.,	1860

† Left the business. ‖ Ill health.
‡ Inability to attend the meetings. § No reason given.

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